Inside: Factory Automation ■ Adhesives & Fasteners ■ Motion Control ■ Bearings

DPN DESIGN PRODUCT NEWS

September 2006

Covering the total design engineering function in Canada

Helical gear mounting system

SEW-Eurodrive has expanded its patented TorqLOC keyless hollow shaft design to fit larger parallel shaft helical and helical-bevel gear units with bore sizes from 5/8 to 2-15/16 in. TorqLOC bushings allow cold-rolled and turned shaft stock to be used without additional machining.

sew-eurodrive.ca **Info Card 338**

World's fastest CNC controller

Miceli Technologies Inc. has introduced a CNC controller with a processing capability of 50,000 blocks/s, said to be the world's highest average feed rate. The controller includes support up to 6 axes and RTCP functionality for 4- and 5-axis kinematics.

miceli-technologies.com **Info Card 339**

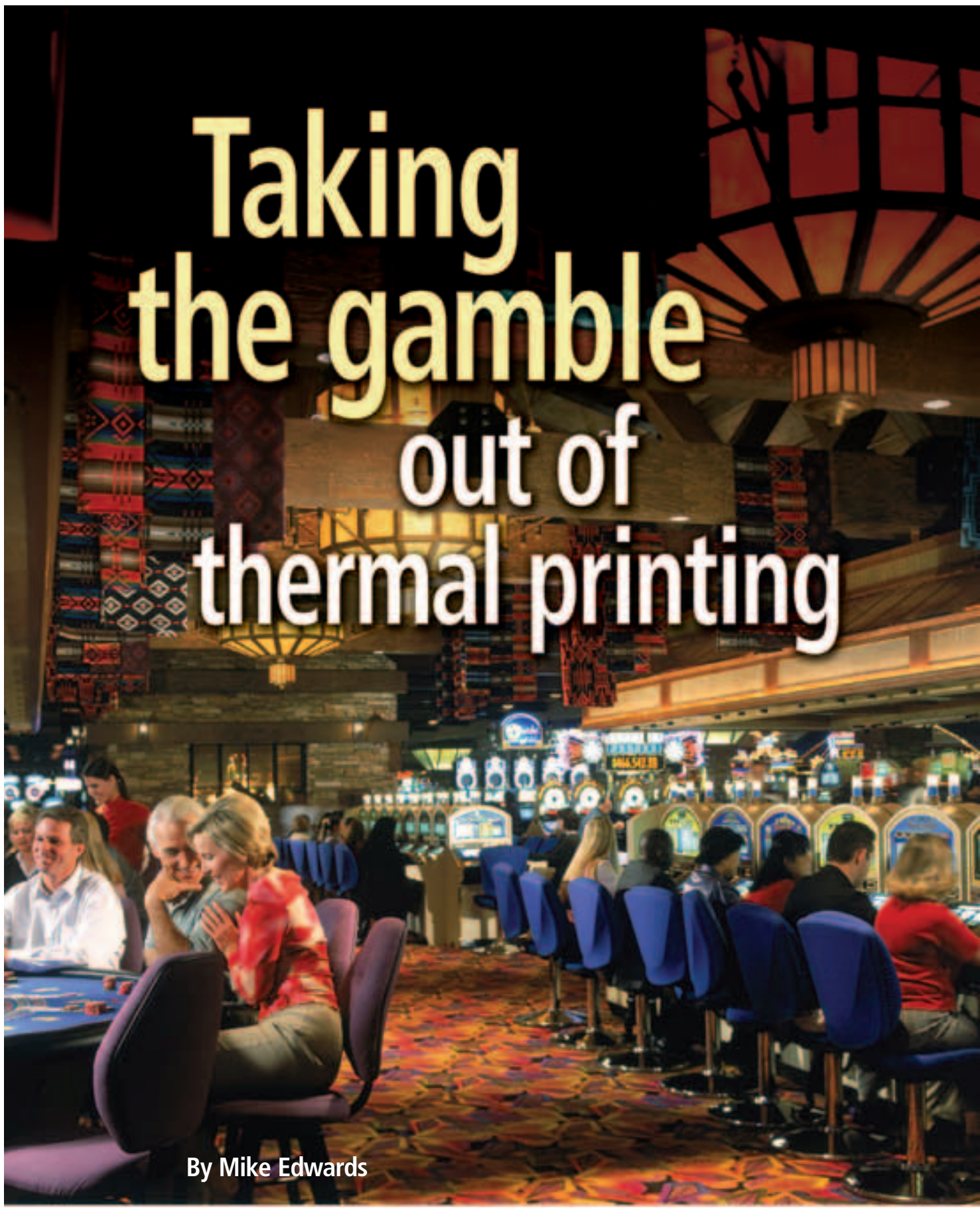
Disposable medical connector

Fischer Connectors has introduced a connector system for designing and manufacturing disposable medical devices. The Limited Use Connector offers multiple configurations and can accept 2 to 19 pins with solder or crimp contacts.

fischerconnectors.com **Info Card 340**

Volume 34 Number 5

PM# 40063602 R# 10773



By Mike Edwards

Casinos don't like to gamble when it comes to their choice of thermal printers in slot machines.

Printer manufacturer Nanoptix Inc. of Dieppe, NB, has successfully targeted gambling resorts in California and is currently launching its latest in thermal printing technology, the PayCheck 3 printer. According to Nanoptix software and firmware head engineer Sylvio LeBlanc, the company's DSP-based platform makes its printers a lot quicker than anything on the market.

"Digital signal processing in the PayCheck 3 printer means that slot machines can produce cash out tickets that much faster – 1.2 seconds instead of the 5 to 8 s of the competitors," said LeBlanc.

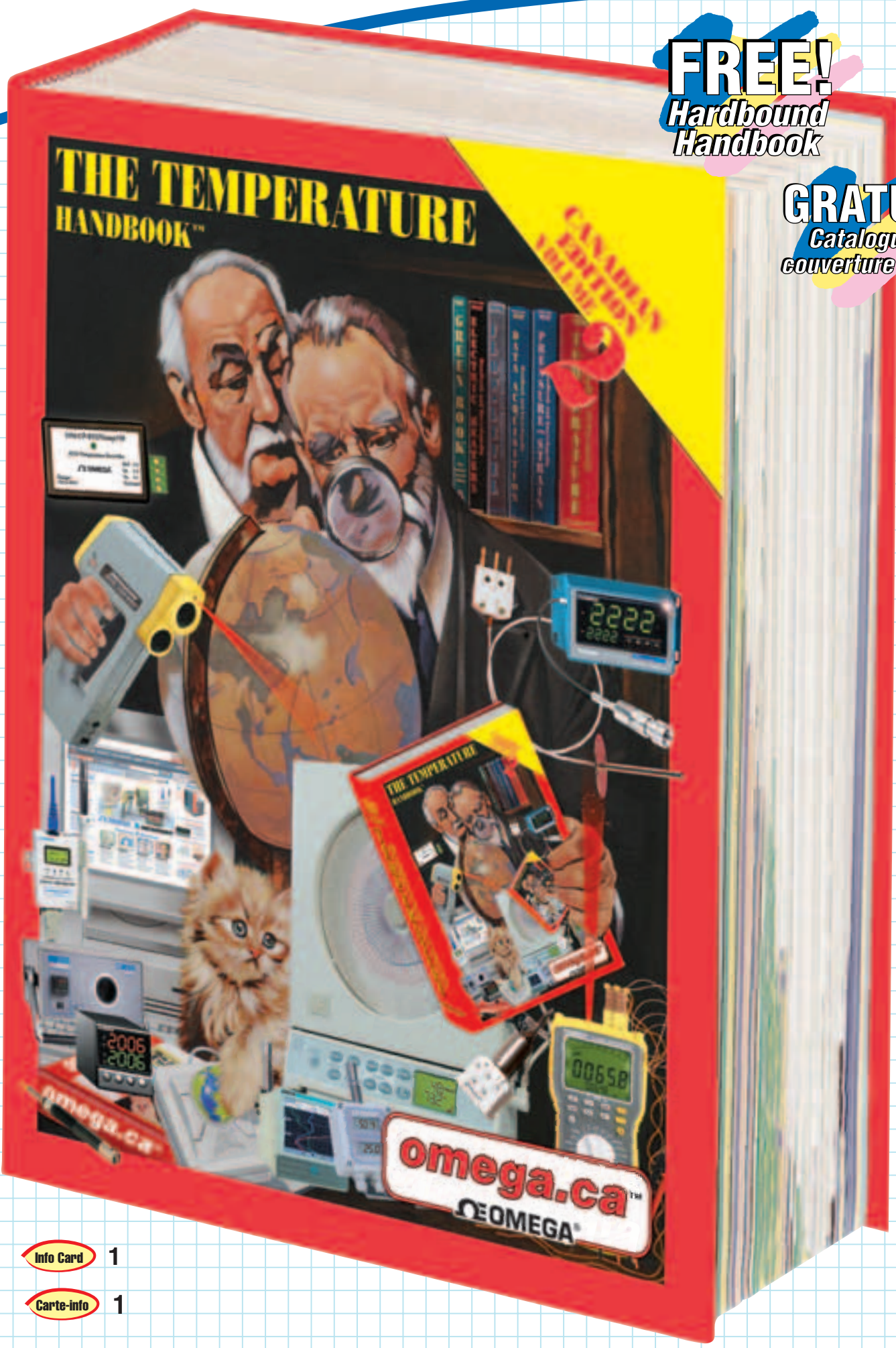
Nanoptix (nanoptix.ca) relies on proprietary DSP algorithms and computer codes to distinguish itself in the market. Thermal printers employ resistive elements that act as miniature ovens which create precise dot patterns on thermal paper. LeBlanc explained that Nanoptix-developed DSP image processing and predictive algorithms control the ramping up/down of the heat on each element, deciding the best way to lay down a dot on each line.

"The printer doesn't have to 'wait' for the

Continued on page 8

What's NEW at omega.ca

Quoi de NEUF chez omega.ca



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- Transmetteurs
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Info Card #1

The most practical micro PLCs you can buy!

25 option cards to expand your I/O and applications

DL06 PLC

starting at $199

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- **Two communication ports**
- **Eight fill-in-the-blank PID loops with autotune**
- **Optional LCD display**
- **Built-in real time clock/calendar**
- **Nine models available**

I/O modules work in both DL05 & DL06

DL05 PLC

starting at $99

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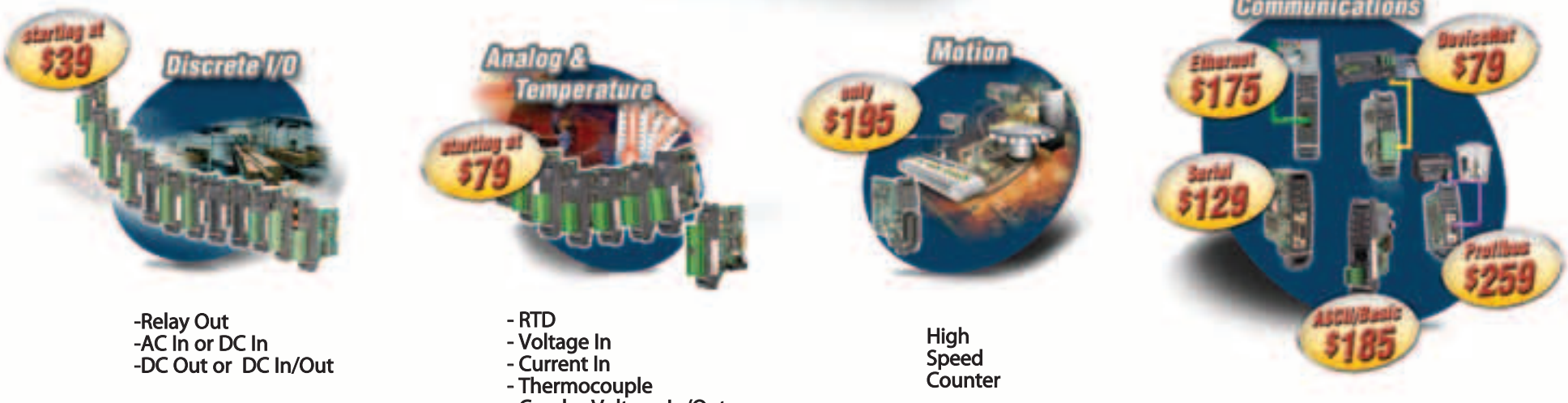
- **Expandable to 30 I/O**
- **Two communication ports**
- **Four fill-in-the-blank PID loops with autotune**
- **Eight models available**

The DL05 and the DL06 are a family of micro PLCs designed to fit more applications than any other PLC family in their class. Starting with the DL05 at 8 inputs/6 outputs, all the way up to the fully expanded 100 I/O DL06, these PLCs are a standard that can grow with the changing needs of your machine or process control application.



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- Seven analog I/O option cards
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Communication and Specialty modules

Option modules that give you even more communications and application flexibility include:

- Two-port serial communication module
- Ethernet, DeviceNet, Profibus option cards
- High speed counter/pulse output module
- Basic CoProcessor module

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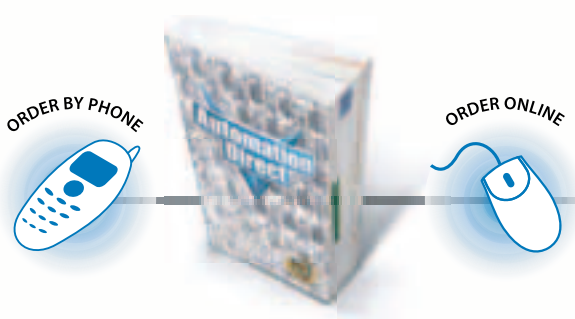
DL06	Automation Direct DirectLOGIC DL06		Allen-Bradley MicroLogix 1200	
Integrated I/O				
Inputs	20		24	
Outputs	16		16	
Total program/data memory	14.8K		6K	
Integrated communication ports	2		2	
Integrated networking port	YES		NO	
ASCII in/out	YES		YES	
Integrated real time clock	YES		YES	
Price with AC Power Supply				
DC inputs/DC outputs	$199		NO	
DC inputs/relay outputs	$229		$770	
AC inputs/relay outputs	$259		$796	

All prices are U.S. list prices. AutomationDirect prices are from September 2006 prices. Allen-Bradley prices are from Publication ACIG-PL001F-EN-P September 2005. Allen-Bradley Micrologix 1000 Installation Instructions Manual 176151. MicroLogix™ 1200 Programmable Controllers Bulletin 1762 Controllers and Expansion I/O User Manual, Publication 1762-UM001B-EN-P - November 2000. MicroLogix™ 1500 Programmable Controllers (Bulletin 1764) Publication 1764-UM001A-US-P - April 2000.



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Info Card #2

In this issue

CAD Industry

PTC positions itself as a one-stop shop for design

The PTCuser World Event 2006 in Dallas outlined PTC plans to beef up its technical documents capability a year after the acquisition of tech doc specialist Arbortext. The company also announced further integration of another acquisition, Mathcad, a natural mathematics notation software, into its Pro/Engineer MCAD package.

FEATURING:

Phoenix Contact solidifies presence in the Maritimes

Interconnect and industrial automation company hooks up with distributor Guillevin International

Industrial careers at top of PTDA conference list

Event in Ottawa also sets sights on economic outlook, building business relationships

SolidWorks 2007 launched in a racing environment

Bill Fane test drove latest MCAD release along with a Skip Barber Racing Schools Formula Dodge

DEPARTMENTS:

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Danaher Motion weighs pros and cons of direct drive designs and retrofits

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Festo on the use of intelligent valve terminals to provide more precise diagnostics

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Mark Sunderland discovers leading edge back pain research in Alberta

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Course Title	Date	Duration	Cost (USD)
Dimensional Metrology	Oct 18,19	2 days	$796 pp
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Info Card #3

Renderings

Good luck always seems to come to those who are properly prepared!

By Mike Edwards, Editor

Flying back from Chicago after a recent software briefing, I found my seat companion represented an Ontario-based manufacturer of costume jewelry. Remarkably, I discovered, his company still did all its design work with pencil and paper, using – *GASP* – no CAD software whatsoever!

Naturally, most of you probably do not still produce your designs on drafting tables, but use some sort of 2D drawing software, with the occasional desktop computer fitted out with sort of 3D mechanical CAD program.

Fortunately, Raymond Kurland of Clifton, NJ-based TechniCom, Inc. (technicom.com) has authored Selecting a

Selecting a CAD system tends to be done at too low a level

Mechanical CAD/CAM/CAE/PDM System for Small and Medium Businesses. (The 12-page white paper is available at ptc.com/go/buyersguide.)

In his introduction, Kurland states what many of us have felt, all to painfully: "Selecting a CAD/CAM/CAE/PDM (CCCP) system for small businesses is no easy task.

"Without the resources brought to bear by large companies, in many cases selecting a system tends to be done at too low a level, with poor consideration of company strategic issues, with little understanding of the product development environment and any proposed improvement, and with little idea of expected ROI or metrics."

The steps in buying a new product development system are clearly and logically laid out in the white paper:

Step 1
Begin the process of deciding whether to improve your existing mechanical CCCP system or to change to a new system by answering a few simple questions (below).

Step 2
Identify the potential benefits of a new system. Look for improvement by understanding what company performance should be improved.

Step 3
Decide on the requirements of a new system and translate desired improvements to system requirements.

Step 4
Decide what a new system should include and what it should cost.

Step 5
Select a CAD/CAM/CAE/PDM system (making sure the best system is selected).

Step 6
Implementing the system (plan for success) in more detail.

Now ask yourself some tough, self-examination questions to see if you need to change or improve:

- When did you last update your system for product development?
- Are your engineers/designers primarily designing using 3D?
- Are you happy with your product quality?
- Are you happy with your product development times and the time it takes to bring products to market?
- Do you respond to a high percentage of RFPs in a timely fashion?
- Are your development and go-to-market costs in line with your competitors?
- Are you able to interact with global suppliers in the design phase as well as you should be?
- If need be, can you exchange design data with your customers and/or suppliers? In this exchange, can you retain security on your key product data?
- Are your engineering and manufacturing bills of material kept synchronized?
- Can you effectively access and use portions of prior designs in new products or projects?

If you answered "No" to any of these questions you are operating with a deficient CCCP system, Kurland states.

As for my seat companion on that recent flight, at least I was able to recommendation a jewelry-specific CAD program. And maybe one day I'll get a free, software-designed belt buckle in the mail (silver, please, it goes with my wardrobe).

If you found **Renderings** interesting, please fill in Info Card **344** or send a message anytime to medwards@clbmedia.ca.

The choice is clear…

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SOLID EDGE vs. SolidWorks

Top View of 10,895 part assembly, no hidden lines
TIME (MIN:SEC) 4:28 Solid Edge 13:02 SolidWorks

Top View of 10,895 part assembly, hidden lines
TIME (MIN:SEC) 8:25 Solid Edge 44:04 SolidWorks

Draft Quality View of 10,985 part assembly
TIME (MIN:SEC) 1:15 Solid Edge 2:58 SolidWorks

…and our customers confirm it.

"SolidWorks had too many pop-up menus and you were always having to confirm and constrain everything you wanted to do. Solid Edge required 30 percent fewer keystrokes so you could work much faster. The software wasn't always interrupting your flow."
Per Carlson, MJC Engineering & Technology Inc

"I evaluated eight systems, including Inventor and SolidWorks and determined that Solid Edge by far has the best 2D to 3D AutoCAD compatibility out there. I found that Solid Edge met or exceeded our requirements in almost every aspect."
Michael Valcarcel, Lochinvar Corp.

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Info Card #4

By Design

Growth spurs OneCAD Solutions to open Ottawa sales office

MARKHAM, ON – With unprecedented sales growth in the first half of 2006, Neil Thomas, managing director of **OneCAD Solutions Ltd.** has announced the opening of OneCAD's Ottawa office (onecad.com).

Neil Thomas (left), managing director of OneCAD Solutions Ltd. and Ian Creelman, Ottawa office engineering sales representative.

This office will help service OneCAD's current Ottawa clientele and introduce new companies to OneCAD's design solutions. Ian Creelman, a bilingual engineering sales representative with OneCAD will initially handle the office as OneCAD will be looking to further expand with additional sales and technical staff for the Ottawa region.

Creelman recently graduated as a mature student from Carleton University, acquiring his mechanical engineering degree. He is passionate about technology and has already proven himself to his customers as a valuable asset for both sales and customer service, Thomas said.

OneCAD Solutions provides CAD, PLM and FEA solutions from **UGS** including Solid Edge, Teamcenter Express and FEMAP with NX Nastran (ugs.com) and 3D Printing (rapid prototyping) sales and service bureau from **Z Corporation** (zcorp.com).

CFPA raises funds for education programs

The **Canadian Fluid Power Association** (cfpa.ca) leaned on Women's Gold Medal Hockey Olympians at its annual CFPA golf tournament in support of its education programs. The association runs middle and high school student technology competitions in Toronto and Edmonton to raise awareness of careers in hydraulics, pneumatics and automation disciplines.

Auctioneers Gillian Ferrari (left) and Becky Kellar.

Ribbon cutting at the grand opening of Schneider's Customer Solution Centre: Alan Dickinson, VP of operations, Schneider Electric Canada (left) and Gary Abrams, president, Schneider Electric Canada.

Schneider launches facility for panelboards, switchboards

TORONTO – Schneider Electric's has opened its Ontario Customer Solution Centre (OCSC) to custom-design and manufacture electrical switchboards for industrial and commercial applications across Canada (schneider-electric.ca).

"Our engineers use the latest technology to custom-design switchboards and panelboards to meet the most complex specifications," said Alan Dickinson, vice president Operations, **Schneider Electric Canada**. The 38,000 ft² manufacturing facility's 50 employees will complement Schneider Electric's two existing Mississauga facilities – the logistics centre (Caravelle Drive) and Ontario sales and national technical support centre (Rexwood Road). "With a combined total of approximately 350 employees, these three facilities will form a Mississauga-based cluster of manufacturing, technical support and sales," said Gary Abrams, president, Schneider Electric Canada. "Their proximity to one another and the OCSC's expanded capacity will enhance our customer service levels."

For more information about the Ontario Customer Solution Centre, call Lindsay Banks at (905) 362-3702.

News in Brief

Bishop-Wisecarver vet

Bishop-Wisecarver Corp. (bwc.com) has appointed Ray Harrington, a 30-year veteran of the power transmission industry, its vice president of Business Development.

Phoenix, Guillevin team up

Interconnect component maker **Phoenix Contact** (phoenixcontact.ca) and manufacturer rep **C.S.A.** have added distribution partner **Guillevin International Co.** – Atlantic division to its premier sales network.

Snow joins Omron

Omron Electronics LLC has appointed Michael Snow as president of **Omron Canada Inc.** (omron.ca). Snow was previously with Emerson Electric.

Electromate signs Nippon

Electromate Industrial Sales of Woodbridge, ON (electromate.com), has signed a distribution contract with **Nippon Pulse America** of Radford, VA, to sell and service its line of linear shaft motors.

Baumer training strengthens customer support

Baumer Electric (baumerelectric.com) recently put technical service reps (right) through one-day "Sensors Basic Product Training," led by Baumer's product marketing & sales manager, Rick Flokstra. They included Bart Rzeszowski (left), **Torbram Electric**, David Roberts, **Concord Electric**, Harley Cook, **Cook Supply**, Mark Cooper, Torbram, Willie Loomes, Torbram, Mike Edwards, *DPN*, and Flokstra.

Anthony Bezina (left) & Raj Thirun of Siemens Canada, with Craig Knott of Rittal.

Siemens nabs Rittal 'Modsie' award

As part of the National Modular Enclosure Month festivities in April, **Rittal Systems** recognized the achievements of TS 8 Modular enclosure users across Canada in five categories. **Siemens Canada** is the winner in the category "most weight in a TS8 Modular enclosure." The engineers at Siemens designed a drive solution in tight space restrictions.

Calendar

September 26-28, 2006. Mississauga, ON. Canadian Manufacturing Week, including the Design Engineering and OEM show, Weld Expo and the Plant Equipment Maintenance show (reedexpo.ca/cmw).

October 22-25, 2006. Milwaukee. The Investment Casting Institute's 54th Technical Conference and Exposition (investmentcasting.org).

November 5-10, 2006. Chicago. The 2006 ASME International Mechanical Engineering Congress and Exposition (asme.org).

November 14-16, 2006. Anaheim, CA. Aerospace Design Expo 2006, a new global event for aerospace design and development engineers (aerospacedesign-expo.com).

See more events @ dpncanada.com

Schunk Canada sales office established to provide technical support

MISSISSAUGA, ON – With the opening of **Schunk Canada** in July 2006, Canadian customers of Schunk products will receive technical support and customer service directly from the new sales office in Ontario (schunk.com), in addition to the existing distribution partners like **Sempress** (Ontario) and **Dicsa** (Quebec). "Results for Canadian customers will be better pre- and post-sales support together with fast product delivery," said Christopher Nagel, general manager of Schunk Canada.

With more than 1300 employees worldwide and five manufacturing facilities in Germany, the U.S. and China, Schunk is a supplier of automation, tool-holding and workholding components. In the field of automation, Schunk offers components such as grippers, rotary actuators, linear slides, and robot accessories.

Christopher Nagel

Image courtesy of the engineering team at YORK International Corp., Refrigeration Systems Division of North America

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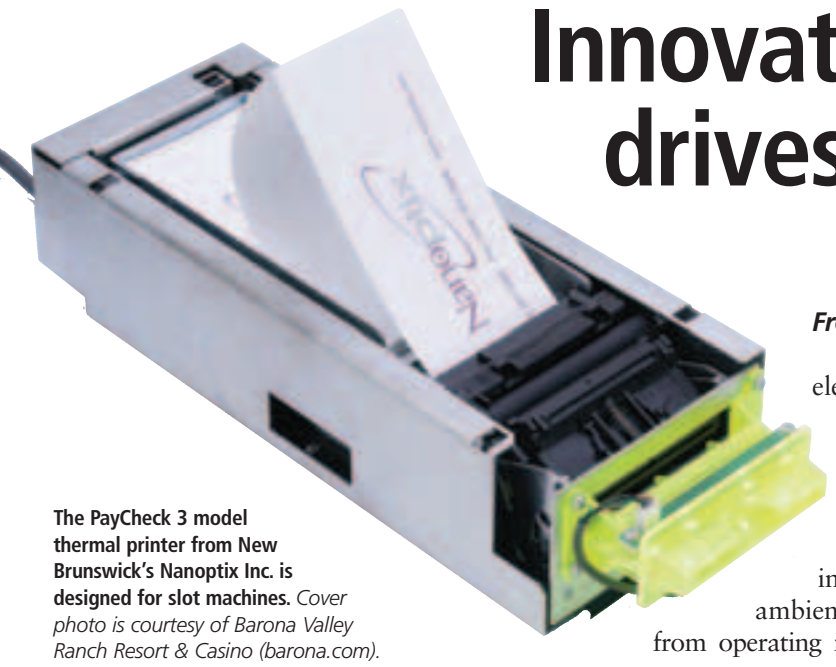
Info Card #5

Cover Story

Innovative use of DSP technology drives thermal printers



The PayCheck 3 model thermal printer from New Brunswick's Nanoptix Inc. is designed for slot machines. *Cover photo is courtesy of Barona Valley Ranch Resort & Casino (barona.com).*

From Front Page

element on every step. DSPs help us incorporate all the variables and compensate for them, including warm ambient temperatures from operating indoors or in the cold of an outdoor environment.

"Heat sensors provide ±1°C accurate feedback from the print head, while A/D converters help compensate for temperature and voltage fluctuations."

Besides gaming, the company also has thermal printer models for point-of-sale (POS), kiosk, ATM, transportation, gaming and lottery applications.

The "Spill Proof" and more recent "Spill Proof Cuts" POS units are suitable for restaurant, bars and commercial kitchen environments.

LeBlanc noted that the speed improvement from DSP technology is especially

Slot machine, food orders can be processed much more quickly

important in POS applications.

"Food and drink orders can be processed more quickly. A really long receipt can make the customer wait and the restaurant loses time in serving the next customers in line."

Print quality is important, too. "Bar code crispness, both in the horizontal and vertical axes, means laser scanners will be able to read receipts properly."

The clamshell enclosure design of the "Spill Proof" series deflects liquids from entering the printer, as well as airborne particles. A paper roll change can take as little as 5 s, said LeBlanc.

Moving parts consist of the cover head that moves up and down on two pivot points, a button to disengage the

Restaurant operators can improve customer service with the "Spill Proof Cuts" thermal printer.

motor, gears and motor for the printing mechanism, and a rubber roller for paper traction.

Nanoptix printers will support USB, RS232, RS485 (IEEE 1284) and Ethernet. The company also supports command sets for third party software and will even offer built-in emulation so that its products instruction sets behave like a competitor's. "That way," LeBlanc explained, "our printers become a plug-and-play replacement in existing installations."

Manufacturing of all Nanoptix printers is in done in New Brunswick, including stuffing bare circuit circuit boards, mechanical assembly and testing.

Info Card 337

IT'S ALL IN THE ENGINEERING

THK engineers design and develop products that outperform and surpass all industry standards. Longest maintenance-free operation (three times longer than any competitor brand), THK products provide more than 30,000 kM (18,000 miles) of operation without maintenance. The highest speeds, heaviest load capacities, and the smoothest and quietest operation all result from our patented Caged Ball Technology. Look to the leader for an edge, with innovative products designed for your every linear motion need. Linear guides, ball screws, a complete line of actuators, and fully integrated assemblies make THK the one company to work with in building your products.

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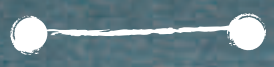
Info Card #6



Concept Completion

(The SolidWorks® Design Timeline)

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With SolidWorks 3D design software, you can speed up product design and reduce errors. SolidWorks offers unique capabilities and integrated design validation tools that let you create, test, and revise your designs easily, so you can get design work done 20-30% faster.

To see for yourself, go to solidworks.com/timeline

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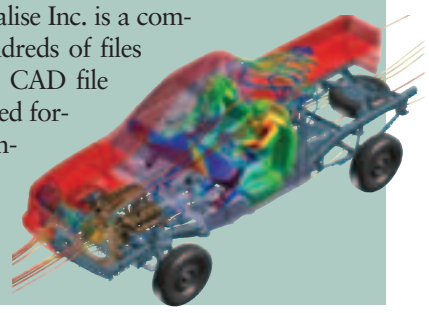
Info Card #8

CAD Chronicle

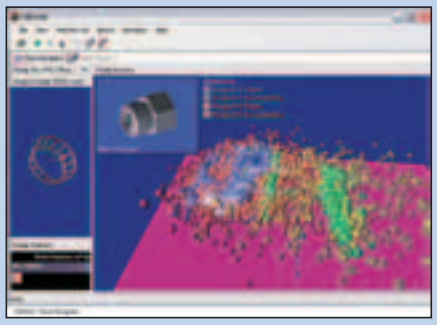
Fluent CAD interoperability and mesh generation

Fluent Inc., a wholly-owned subsidiary of **Ansys, Inc.**, has released TGrid 4.0, GAMBIT 2.3 and 3Matic-for-Fluent 1.0, all said to be major upgrades to Fluent's preprocessing capabilities. The three products provide several functionality advantages: TGrid 4.0 has a Surface Wrapper added to its existing surface and volume meshing capabilities. The 3Matic-for-Fluent software from Materialise Inc. is a complementary conditioning module for converting hundreds of files from mixed geometry sources in native or standard CAD file formats (CATIA, UG, Pro/E, STEP, IGES), or in faceted formats (STL, WRML), into an optimal triangular meshing format for TGrid 4.0's new Surface Wrapper. GAMBIT 2.3 allows users to bring native geometry into GAMBIT more effectively.



fluent.com Info Card 335

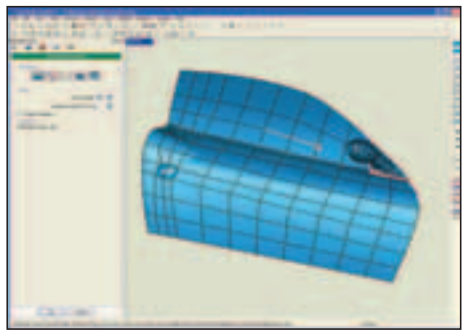
Streamlining file searches for parts, assemblies



iSEEK Corp. has announced shape-based search technology called CADSEEK, designed to integrate with an organization's CAD software to perform fast and accurate, geometric-based parts and assembly searches. A searcher can also navigate through an enterprise-wide CAD database by zooming in and "flying over" the entirety of files.

iseekcorp.com Info Card 331

Digital reconstruction software enhanced 3 ways



Geomagic has released Geomagic Studio 9, digital reconstruction software that features three major areas of enhancement: 3D feature-based modeling, advanced color texture generation and greater versatility with user-defined patch layouts. As a software tool, Geomagic Studio is said to automatically process 3D scan data for applications ranging from reverse engineering to design and analysis, as well as automatically create accurate models from any physical part.

geomagic.com Info Card 332

Mathematics software tool

Maplesoft has announced the Maple Toolbox for MATLAB, designed to combine the best of both symbolic and numeric worlds for developing mathematical solutions and performing in-depth analysis of the results. The toolbox consists of two components: Maple 10, a tool for solving complex mathematical problems and creating executable technical documents; and the Maple-MATLAB Connector. The Connector is an add-on to Maple 10 that provides a two-way link between Maple and MATLAB, enabling users to define variables in either environment and use them in the other.

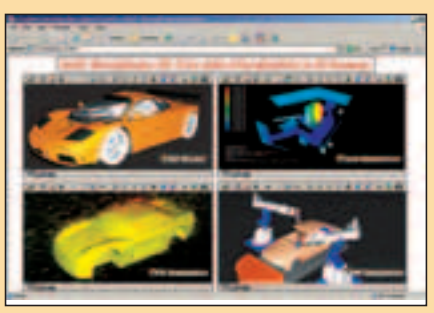
maplesoft.com Info Card 333

Estimating manufacturing costs during design phase

Boothroyd Dewhurst has announced DFMA 2006, Design for Manufacture and Assembly (DFMA) software. The software contains DFA Version 9.3, and DFM Concurrent Costing Version 2.2. It guides users through the process of simplifying a product design, then estimates assembly labor and part manufacturing costs, as well as provides choices for part manufacture and finishing.

dfma.com Info Card 334

Multidisciplinary platform for visual collaboration



Visual Collaboration Technologies Inc. has announced VCollab 2006. The suite of software provides a common platform for viewing and manipulating 3D digital product design, analysis, and manufacturing information authored in different engineering formats without having to access the native applications. The suite compresses large CAD, CAM, and CAE data sets to the .vcb format.

vcollab.com Info Card 336

Info Card #9

ifm efector is focused on practical innovation that simplifies sensors and controls

PMD sensor
Distance measurement for automation applications

Innovation step –
Smart pixel sensor element with "time-of-flight" measurement, resulting in a new benchmark for performance and price.

Info Card #10

Dualis sensor
Compact inspection sensor for error proofing applications

Innovation step –
CMOS image element, on-board software, and a signal processor in a 40 mm x 40 mm industrial housing.

Info Card #11

PK electronic pressure sensor
Replaces mechanical switches

Innovation step –
Strain gauge sensor element rated for over 50 million switching cycles and simple setup with two rotating dials for selecting set-point and reset-point values.

Info Card #12

Octavis sensor
Continuously monitors critical bearings on pumps, motors, and gearboxes

Innovation step –
Integrated MEMS accelerometer measures vibration and diagnostic electronics to process and interpret data. Eliminates expensive hardware and time-based vibration readings.

Info Card #13

Metris sensor
Monitors compressed air usage on machines to reduce operating costs

Innovation step –
Ceramic sensor element detects small leaks in pipes and also measures high capacity consumption of compressed air.

Info Card #14

To learn more about our i-Step solutions, visit www.ifmefector.ca or call us at 800-441-8246 and dial 2.

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sensors and controls
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Spotlight

Factory Automation

Ethernet/IP fieldbus coupler

WAGO Corp. has announced that its 750-341 fieldbus coupler and 750-841 programmable fieldbus coupler products both passed the latest EtherNet/IP compliance levels. The 750-841 is an IEC 61131-3 compliant unit with a 32-Bit, multi-tasking CPU and 1 M of memory. The 750-341 is an I/O adapter for those applications that don't require distributed programmability.

wago.us Info Card 301

Aluminum tabletop robot

IAI America has announced the TT Tabletop Robot. The unit features a rigid base of aluminum extruded material, a ball screw and a servo control motor that combine to allow positioning repeatability of ±0.02 mm. The robot can be used in conjunction with a teaching pendant, PC software or other tools. The robot is available in two types, gate or cantilever.

intelligentactuator.com Info Card 296

Variable frequency drives

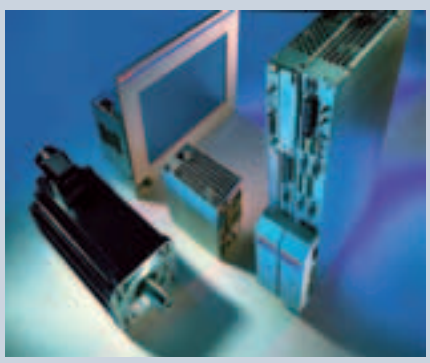
VLT AutomationDrive variable frequency drives from **Danfoss Drives** are now available in the 40 to 60 hp power range. This power extension covers IP21 and IP55 rated enclosures in the voltage range 380 to 480/500 V. The user can program the drives to adapt to complex operations at various points in the line using the built-in Smart Logic Controller.

namc.danfoss.com Info Card 305

Brushless motor control

Intelligent Motion Systems has introduced MDrive17Plus Motion Control product, combining an integrated microstepping driver/intelligent motion controller/NEMA 17 brushless high torque motor in a package as little as 2.2 x 2.3 x 1.7 in. Patented 2nd generation technology of the Plus MDrive is said to deliver advanced current control flow through the motor.

imshome.com Info Card 306



Label printing,converting

The integrated PLC runtime system IndraLogic conforming to IEC 61131-3 is **Rexroth's** latest addition to the automation facilities offered by the system solution SYNAX 200. The full system solution comprises all the necessary compatible components from the ac servo drives and motion logic integration right through to HMIs.

boschrexroth.ca Info Card 298

Flat conveyor belts

BRECOflex CO., L.L.C. offers a large variety of seamless ESBAND flat belts with and without carcass. Customized belts can be designed for individual applications. The Hytrel HT Elastic 40+ Silicone belt is specifically designed to position and convey PVC cards in card printers, card readers, and card handling devices in general. The silicone belt is said to offer strong adhesive on the PVC-Cards at the carrying side (silicone layer) and a smooth surface (Hytrel) at the running side (pulley contact).

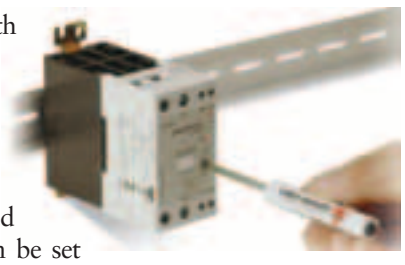
brecoflex.com Info Card 302

Miniature light curtain sensor

Baumer Electric has introduced the ParCon ZADM 034P, a digital optical line sensor that projects a continuous 24 mm wide parallel beam to a reflector, permitting detection of moving parts down to 0.5 mm. The 67 x 34 x 16.6 mm sensor detects and counts both metallic and non-metallic objects at processing rates in excess of 0.25 ms. The sensor is suitable for counting pills, screws, tablets, plastic parts, seeds and other small objects, including those in blister packaging. The light beam allows the sensor to detect and measure thick or thin objects regardless of their location within the sensing field.

baumerelectric.com Info Card 307

Current monitoring solid state relay



Carlo Gavazzi has expanded its Solitron series with the addition of the RJCS series current monitoring solid state relay. The microprocessor-controlled relay is capable of switching 50 A single phase ac loads at up to 660 Vac, when controlled by a 4 to 32 Vdc signal. Its internal current sensing circuitry monitors and reacts to a number of load failure conditions. The relay's alarm functions can be set locally or remotely from a standard PLC. Internal over temperature and over current protection is standard. The unit can be ordered with either NPN or PNP normally open or closed alarm outputs, has an integrated heat sink and snaps to DIN rail.

gavazzionline.com Info Card 297

Operator interface display

Z-World has announced its OP7100 Smart Screen's C-programmability provides the flexibility required for most display applications. The Smart Screen is suitable for remote terminals, automated machinery, and control systems. The touchscreen display features a blue-on-white graphic LCD (320 x 240 pixels). A total of 16 digital I/O are available: 8 CMOS/TTL-level inputs and 8 CMOS/TTL-level outputs. The touchscreen or a separate keypad can provide the user interface. Horizontal or vertical orientations are user selectable in software.

zworld.com Info Card 300

Ethernet TCP/IP bus control

With the introduction of the BX9000 Bus Terminal Controller, the range of Ethernet TCP/IP controllers from **Beckhoff Automation** has become even more scalable, the company says. The BX9000 features a direct connection to the entire Bus Terminal I/O system of over 180 terminal designs. BX series controllers feature an illuminated display with 2 lines of 16 characters each and a joystick switch for user interaction or diagnostic information.

beckhoffautomation.com Info Card 303

Ultrasonic positioning

Pepperl+Fuchs has introduced the UOS-100 Ultrasonic Positioning System. Consisting of ultrasonic emitters, receivers and a control interface, the system is designed to enhance error proofing in industrial assembly applications. The system covers from propagation time measurement to the output of the calculated x, y, z coordinates of the object to be positioned.

am.pepperl-fuchs.com Info Card 299

Technical Literature

Mechatronics. *Essentials of Mechatronics*, a 280-page reference book by John Billingsley interweaves mechanisms, electronics, sensors, and control strategies with software and information technology to examine the demands and ideas of customers, and find the most efficient, cost-effective method to transform goals into successful commercial products.
essmech.com **Info Card 440**

Automation components. The *Allen-Bradley Essential Components* 632-page catalog has sections on power, logic, operator interfaces, connectivity, safety, and, sensing and switching.
rockwellautomation.com **Info Card 441**

Electronic components. 600-page catalog from **Digi-Key** covers electronic components such as connectors, wire and cable assemblies, capacitors, resistors, inductors, switches, batteries, fans, sensors and industrial controls.
ca.digikey.com **Info Card 442**

Aluminum fittings. Catalog published by **Kee Industrial Products, Ltd.** describes the Kee Lite slip-on, aluminum pipe fittings. Designed to build or repair a wide range of railing and tubular pipe structures, Kee Lite fittings are said to be a cost-effective and labor-saving alternative to welded railings.
keelite.com **Info Card 443**

Pneumatic components. Clippard Instrument Laboratory, Inc. has introduced a 36-page catalog containing the Maximatic line of pneumatic solenoid and air-piloted valves, FRLs and components.
clippard.com/maximatic-b **Info Card 444**

Drive components. An interactive CD-ROM from **Stock Drive Products/ Sterling Instrument** includes over 2500 updated product pages with four major SDP/SI catalogs totaling over 3000 catalog pages in .PDF and .HTML covering over 68,000 drive components.
sdp-si.com **Info Card 445**

Dispensing equipment. I&J Fisnar Inc. has announces its *Dispensing for all applications* catalog offers product sections such as dispensers, dispensing accessories, tips and barrels, valves, robots and automatic systems, and meter mix.
ijfisnar.com **Info Card 446**

Interconnect design. The **Samtec, Inc.** ability to provide "Signal Integrity at any Distance" is detailed in its *Interconnect Design and Signal Integrity Services Guide*. It includes products for panel-to-panel, panel-to-board, cable-to-board and board-to-board applications as well as signal integrity design resources including PCB design tools.
samtec.com **Info Card 447**

Sensors. Pepperl+Fuchs has introduced the *2006-2007 Sensor Catalog and Selection Guide*. The 900+ page resource details inductive, capacitive, photoelectric and ultrasonic sensors, as well as cordsets and accessories.
am.pepperl-fuchs.com **Info Card 451**

Fluid processing. The *2007/08 Cole-Parmer General Catalog* has 2600 pages with more than 60,000 featured products, including 11,000 new items for electrochemistry, fluid handling, industrial process, laboratory research and safety.
coleparmer.com/2010 **Info Card 449**

Info Card #15

Feature: Motion Control

Direct drive motors eliminate the transmission between motor and load

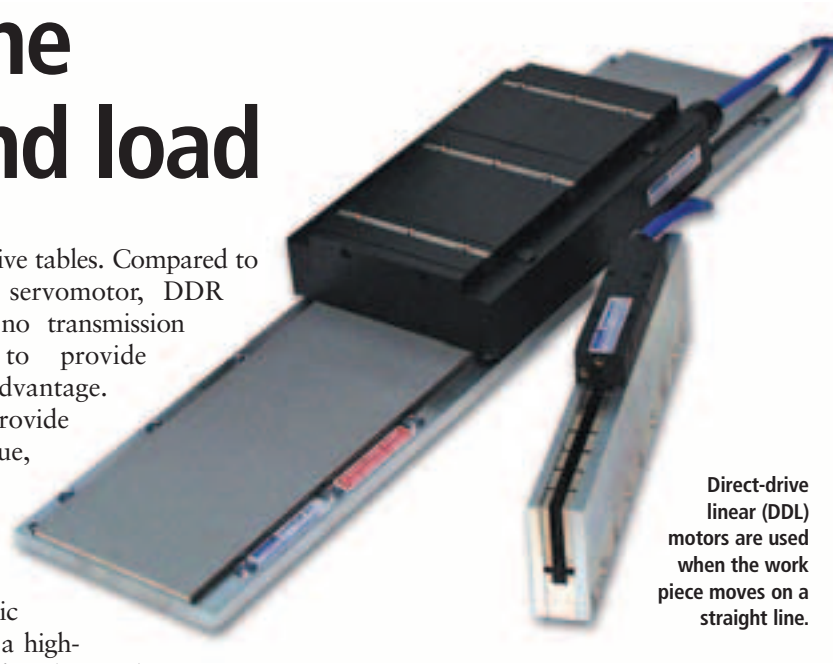
By Jeff Arnold

Rotary and linear systems reduce machine compliance

Direct-drive motors eliminate the transmission between motor and load. With direct-drive motors, there are no shafts, couplings, gearboxes or belt/pulley sets.

There are two types of direct-drive motors: linear and rotary. Direct-drive linear (DDL) motors are used when the work piece moves on a straight line. Magnets are laid side-by-side in a magnetic way to span the length of travel. The coils are also laid side-by-side. The coil assembly, sometimes called the platen or table, slides along the magnet way with a clearance of 0.015 to 0.030 in. While the shapes are different, the principles of linear motors are similar to those of rotary motors. The electromagnetic interaction, feedback devices, and servo drives for linear motors are largely derived from rotary motors.

Direct-drive rotary (DDR) motors are used when the final motion is rotational, typically on drive tables. Compared to a traditional servomotor, DDR motors have no transmission components to provide mechanical advantage. They must provide more torque, albeit at lower speeds. This requires more magnetic structure with a higher number of poles and coils, which makes the motor larger in diameter. DDR motors are sometimes sold as complete motors and sometimes as separate components (called "kit" or "frameless" form), which are integrated into the machine by the machine builder. In most cases, DDR motors have a large-bore hole in the rotor to pass plumbing and wiring.



Direct-drive linear (DDL) motors are used when the work piece moves on a straight line.

Direct drive is normally the best means to reduce machine compliance. The transmission can be removed and with it, all the traditional sources of compliance are eliminated. However, direct-drive systems are not immune to problems of insufficient stiffness. The most common problem is when the load is overhung in a direct-drive linear motor. Here, the compliant "spring" is the preload of the linear bearings. The load is off-centre so that force from the linear motor imparts an undesirable rotational torque in addition to the desired translational force. The load rotates some and the linear bearing produces a force to hold the load in-line. That force comes from the bearing races, which act like springs. This source of compliance commonly causes resonance in linear systems. When designing direct-drive systems, bear in mind that the bearing races can form a compliant coupling to any off-centre load. Eliminate or minimize off-center loads to allow maximum performance.

Sometimes direct-drive motors are used to drive compliant transmission components. This often occurs when the direct-drive motor is installed into a machine or device designed for traditional (geared or belted) motors. For example, a machine or device might have been designed for a traditional motor with a gearbox driving a long shaft. If a direct-drive motor were used to replace the motor and gearbox, the compliance from the shaft would remain. Compliance from remaining transmission components can cause problems in direct-drive systems just as they do with traditional motors; stiffening those components will provide similar benefits.

In many cases, direct-drive linear motors can be used by changing out a linear stage. In other cases, a machine will require significant mechanical modifications to use a direct drive motor.

Benefits include reducing zero-speed position error and vibration due to the elimination of transmission components, as well as simplifying machine design by removing transmission components.

Pitfalls include greater sensitivity to varying load inertia because the load inertia is not reduced by a gear ratio, as well as increased cost.

Jeff Arnold is Direct Drive Technology Specialist at Danaher Motion (danahermotion.com).

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Info Card #16

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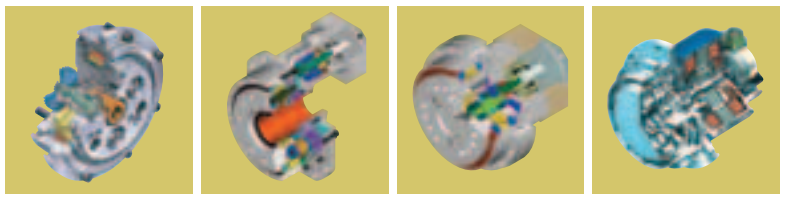

Nabtesco **Tough solutions for tough design problems**

Feature: Motion Control

Business relationships, education, economy highlight PTDA 2006

Industrial Careers Pathway champions: Ted Chisholm of BDI Canada, Susan Hacker of PTDA Foundation, Penny Omnes and Wendy McDonald of The BC Bearing Group, and Randy Singer of BCIT.

The Power Transmission Distributors Association (ptda.org) held its fifth annual Canadian Conference, June 1-3, 2006 in Ottawa. Created to provide Canadian-centric educational programming and networking, the conference provided an opportunity for Canadian power transmission/motion control (PT/MC) channel participants to explore nationally-focused industry issues and trends.

Technical expertise is required in distribution

More than 230 individuals from 23 distribution companies and 55 manufacturers attended the conference held at the Fairmont Chateau Laurier, breaking previous attendance records by 20%.

Invited back for the fifth year, economist Dr. Peter Andersen shared insights on short and long term economic trends affecting the Canadian economy and their impact on the PT/MC industry. In his keynote address, he noted that the Canadian dollar has increased in value by 5% since January 2006, Dr. Andersen predicted it will continue to rise – between ninety-four to ninety-six cents – before returning to the range of eighty-five cents on the U.S. dollar.

Dr. Anderson urged attendees to be conscious of the current second phase of the economic cycle, characteristically a volatile period, and to be prepared for managing the risk inherent in this economic climate. He forecasted a major recession in 2009-2010, but added that opportunities remain for the Canadian economy because of close reliance on the strong U.S. economy.

Training engineers, technologists and technicians in sales distribution continues to be a priority for the PTDA in Canada with its Industrial Careers Pathway (ICP) program in colleges across the country. Ted Chisholm, VP finance at Mississauga, ON-based distributor BDI Canada and an ICP champion, told delegates about the program's progress at Mohawk College in Ontario and at the British Columbia Institute of Technology. "Mohawk has an advisory committee of 25 members and BCIT has 15 members." He noted that the industrial distribution business "is not just a sales environment – technical expertise is still required."

The ICP program was addressed by PTDA executive director Mary Sue Lyon when she asked the conference the rhetorical question in the face of baby boomers impending retirement: "where do I find the

Mary Sue Lyon

Peter Anderson

Wendy McDonald

Ted Chisholm

people I need to sustain this industry?" The student and general population needs to be educated about industrial distribution, too. "No one knows we exist."

Lyon also emphasized that PTDA members need to strengthen their business relationships to "continue to be competitive and profitable." This sentiment was echoed by Wendy McDonald, chairman of BC Bearing Engineers Ltd. and an ICP champion at BCIT: "Business is built on relationships," McDonald told the conference, based on her over 50 years of experience in international and local industrial distribution.

A U.S.-based trade association, PTDA represents almost 220 power transmission/motion control distributor firms with almost 3500 locations throughout North America and 12 other countries, as well as almost 200 manufacturers that supply the PT/MC industry.

Handouts from the conference are available to association members by visiting ptda.org/CanadianConference.

The PTDA 2007 Canadian Conference will be held May 31- June 2, 2007 at the Fairmont Le Chateau Frontenac in Quebec City.

Circle DPN 328

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- Excellent for high load gantry systems
- Zero backlash, high speed and long stroke operation
- Highly accurate – uses NSK LPR Series High Lead Precision Rolled Ball Screws, Grade Ct7
- Maintenance free - equipped with NSK K1 Lubrication Units
- Internal high energy end of stroke shock absorbers help to eliminate accidental damage during system setup
- Stainless steel sealing strip protects the unit from particulate ingress
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Info Card #18

H2 A New Generation in Drive Technology

Reliable. Easy to Use. High Performance.

Baldor's new H2 Series of Inverter, Vector and Servo Drives deliver a new benchmark for industrial drive performance and reliability.

The H2 Series is designed, tested and manufactured to be the most reliable, easy to use, high performance industrial drives you can find! H2 Drives continue the "Harmonized" legacy of unparalleled user-friendly features. All H2 Drives share:

- Identical operator control
- Field installed options
- Simple programming style
- Common operating characteristics
- Unmatched reliability

And, all H2 Drives accept a wide variety of plug-in expansion boards to customize the inputs, outputs and feedback requirements to your specific needs.

Our optional Ethernet server board gives you point and click setup and monitoring of any H2 Drive, from your desktop. You'll be able to monitor drive operation anywhere in the world without the need for additional application programming!

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Info Card #19

Feature: Motion Control

Looking for better accuracy and smoother motion?

Maximize your torque at the desired speed

By Mindy Lin

Step motors have a natural tendency to want to move towards their full step ON position.

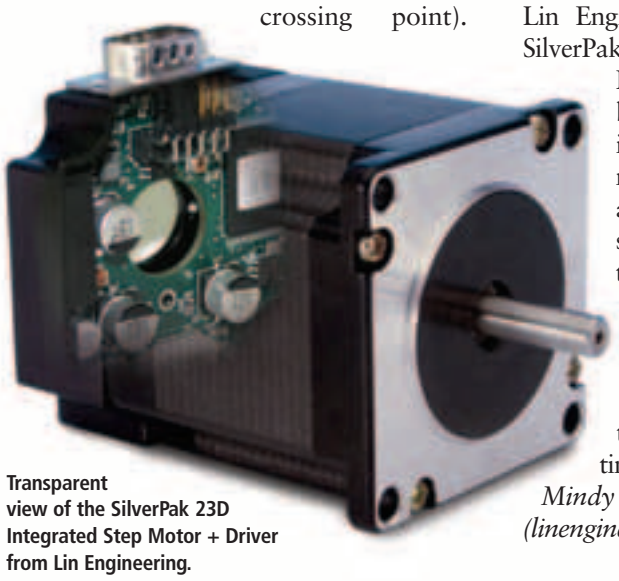
This magnetic pull is called the detent torque of the motor, which causes a jerking motion as the motor nears these positions. In a bipolar stepper motor, one phase will have 100% current and the other phase will have 0% current (this is what we'll call the zero crossing point). Phases A and B are 90º offset and both have a sinusoidal current waveforms.

Engineers in the motion control industry have gone through the trial and error process, tweaking the current sine waves in order to alleviate the "jerk" that the motor makes as it is forcefully pulled towards the zero crossing spots. However, these zero crossing spots are sensitive to the minimal amount of change so altering the waveform can greatly affect other areas of the driver's performance.

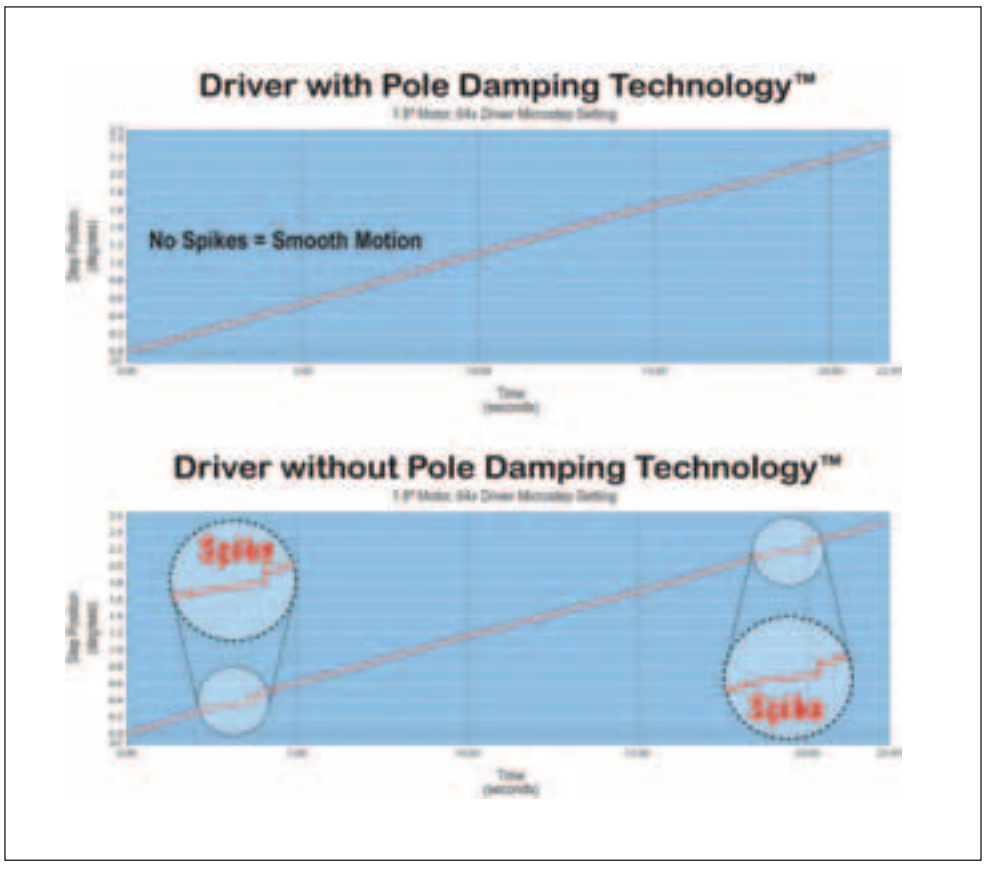
Using Pole Damping Technology from Lin Engineering, the R325 Driver and SilverPak 23D Integrated Step Motor + Driver output the right amount of both holding and running current into the motor to overcome the motor's detent torque. The accompanying graphs use the same step motor to run the step-to-step tests. The R325 and a comparable driver were both set to 64 microstepping, the shaft of the motor was aligned to an encoder which graphed the position of the motor over time.

Mindy Lin is with Lin Engineering (linengineering.com).

Info Card 322



Transparent view of the SilverPak 23D Integrated Step Motor + Driver from Lin Engineering.



As shown in the top graph above, the spikes occur because of the step motor's poles, forcefully being pulled towards each other. These uneven steps translate into a negative affective on the step motor's accuracy and smooth motion. Using a product with Pole Damping Technology (lower graph), the spikes are eliminated resulting in smoother motion and higher accuracy.

Info Card #20

Info Card #21

AC Servo Systems for LESS!

Sure servo™

systems starting at

$965*

The ***Sure*Servo family of brushless servo systems** from AutomationDirect is fully digital and offers a rich set of features at dynamite prices. Choose from eight standard servo motors that can be used in combination with one of three standard servo drives.

- **Eight standard systems from 100 W to 3 kW**
- **Use with *Direct*LOGIC PLCs or any other host control**
- **Drives feature on-board indexer and adaptive tuning modes**
- ***Free* set-up software**
- **Everyday best prices and same-day shipping**
- **30-day money-back guarantee**
- **2 year warranty**

Agency Approvals for Motors:

Agency Approvals for Drives:

Agency Approvals for Systems:

** All components sold separately.*

The *Sure*Servo family is designed for flexibility and quick implementation. *Sure*Servo drives accept a wide range of command sources:

- **Built-in motion controller with preset position, velocity or torque select presets with switch inputs and/or the multi-drop Modbus serial interface**
- **Position commands with "pulse and direction" or "count up and down" format**
- **Encoder follower**
- **Analog voltage Velocity or Torque command**

For configuration, tuning and diagnostics, use the drive's integrated keypad/display or take advantage of the free *Sure*Servo Pro™ PC-based software. Tune the system easily with adaptive auto-tuning selections or a manual mode. Adapt to diverse applications with configurable I/O, including 8 digital inputs, 5 digital outputs, 2 analog monitors and a scalable encoder output.

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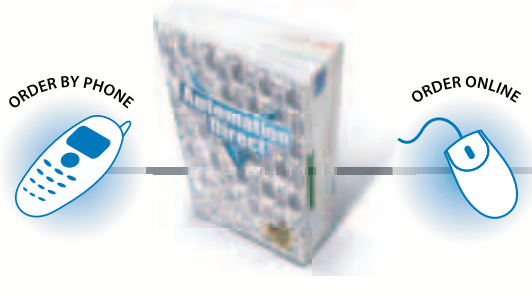
Servo Systems	AutomationDirect Price/Part Number	VS.	Allen-Bradley Price/Part Number
Digital Servo Drive	$479.00 SVA-2040		$832.20 2098-DSD-005
100W Servo Motor with connectorized Leads	$319.00 SVL-201		$553.85 Y-1003-2-H00AA
Breakout Board Kit for CN1 Control Interface	$89.00 ASD-BM-50A		$177.65 2090-U3BK-D4401
10' Motor Feedback Cable	$49.00 SVC-EFL-010		$133.00 2090-UXNFBY-S03
10' Motor Power Cable	$29.00 SVC-PFL-010		$77.00 2090-XXNPY-16S03
Configuration Software	FREE SV-PRO*		$76.95 2098-UWCPRG
Complete 1-axis 100W System	$965.00		$2,017.00

*SureServo Pro software is FREE when downloaded and is also available for $9 on a CD

All prices are U.S. list prices, AutomationDirect prices are September 2006 prices. The Allen-Bradley 100W system consists of part numbers shown in table above with prices from Publication ACIG-PL001F-EN-P September 2005.

For more information, visit:
www.automationdirect.com/servos
or www.sureservo.com



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Info Card #22

Feature: Motion Control

"Where tiny is beautiful"

Traditional Swiss adapt to a hi-tech future

Miniature ball bearing manufactured by Micro Precision Systems AG.

By James Tulk
Special to Design Product News

When you think of Switzerland, it's hard not to think of watches! After all, the Swiss have been making watches for over 400 years and many of the most famous names in the industry are located in this mountainous country.

However, while the Swiss have maintained a dominant position in the market for high-quality luxury timepieces, the introduction of low-cost digital and electronic watches have cost the Swiss a considerable amount of market share at the consumer end of the market.

A miniature pump so small it could be surgically implanted

To meet this challenge, Swiss firms have moved forward with new products and new technologies. At the same time though, the Swiss have kept in touch with their traditions and taken advantage of their long experience in building high-quality and high-precision mechanisms. These developments were presented to a group of international media in May during a tour of Swiss companies and research facilities organized by the Swiss economic development agency 'Location Switzerland.'

One of the companies showcased was Micro Precision Systems AG (mpsag.com), located near the traditional watch-making centre of Bienne. MPS began by making tiny ball bearing assemblies for the watch trade. And, while they continue to service the watch industry, an increasing portion of their business is in non-traditional areas, with products such as miniature rotary and linear ball bearings, ball screws, micro-motors and sophisticated, small-scale mechanisms built around these components.

One example is a high-precision drug-dispensing pump, so small and reliable that it can be surgically implanted into the patient's body. MPS has also built high-precision miniaturized assemblies for use in demanding aerospace, telecommunications, medical and optical applications. While these new applications are often cutting edge, the importance of tradition is clear. As Nicola Thibaudeau, the Quebec born and educated CEO of MPS explained, "Our unique know-how in assembling micro-mechanical components is the fruit of the pure Swiss watch making tradition."

Another company that takes advantage of Switzerland's strong traditions of precision and miniaturization is Advanced Micro Technology AG (am-tech.ch). AMT is a comparative newcomer, set up by the German automation giant Festo.

In 2002, Festo identified miniaturization of components and equipment as an important trend in the automation industry. This trend is driven by the need for "microassembly" of smaller and more complex products for the industrial and consumer markets. Festo also recognized that as automation equipment becomes smaller and more complex, it becomes increasingly important to reduce the number of separate components by integrating multiple functions into each part. (For example, a hydraulic actuator could incorporate a hydraulic cylinder, control valves and position sensors in a single unit.)

With these requirements in mind, Festo decided to set up a special development centre, dedicated to creating a new generation of miniaturized, multi-function products. And, since the emphasis was on quality, precision and miniaturization, it was perhaps natural that they decided to locate this centre in the traditional watch-making region of western Switzerland. Today, AMT specializes in the development of pressure sensors, flow sensors and proportional valves for miniaturized automation devices such as 'intelligent' grippers for production robots.

On a larger scale, Trumpf (trumpf.com) builds laser cutting and laser marking equipment in eastern Switzerland. Here Trumpf produces equipment that ranges from large machining system machines with CO_2 lasers as powerful as 15 kW, down to marking systems that use small solid-state lasers to etch names, logos, serial numbers and other marks onto the surfaces of metal, plastic or ceramic objects.

James Tulk is a freelance writer living in Toronto (jtulk@pr-toolbox.com).

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Info Card #23

Products: Motion Control

Position transmitter

The position transmitter SMAT from Festo continuously records the position of the cylinder piston within a 50 mm range and generates a displacement-proportional analog output signal. With a reproducibility of 0.1 mm, the transmitter has two analog outputs for voltage and current, and can be connected directly to analog input modules of PLC, IPC or Festo valve terminals. The unit is said to be the low-cost, space-saving alternative to potentiometers or inductive sensors that have to be fitted externally on piston rods or drives.

festo.com Info Card 367

Single-axis positioning

The GLM20 single-axis positioning system from THK is capable of operating at speeds up to 4 m/s and 2 G. Accuracies of 1 micron average or better can be achieved. The system provides 3000 N of continuously usable linear force. A instantaneous peak-linear-force of 4500 N is also achieved. The system is available in strokes of up to 4.4 m (in a single unit).

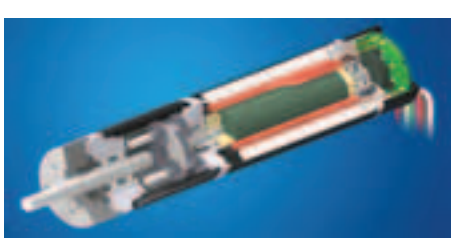
thk.com Info Card 373

Compact frequency inverters

NORD Gear has announced the NORDAC SK 500E and 520E ac vector frequency inverters for extended power outputs ranging from 0.25 to 7.5 kW. Available in sizes between 7.32 x 2.99 x 5.94 in. and 11.26 x 3.86 x 7.01 in., both models feature selectable modes for sensorless vector control that provides a high-starting torque and precise control.

nord.com Info Card 368

Sterilizable brushless motors



The EC-16 line of sterilizable brushless motors from Maxon Precision Motors are assembled such that the coils are outside the rotor to provide good heat dissipation and high overload capability. Steam sterilization is specified at 134°C at up to 2.3 bar for 20 min. Motors can be sterilized at least 100x in an autoclave. The diameter is 16 mm while the length is 56 mm. Continuous output power is 40 W, while maximum speed is 50,000 rpm. Maximum continuous torque is up to 12.6 mNm, depending on the winding.

maxonmotorusa.com Info Card 371

Hydraulic controllers

Bosch Rexroth Canada has announced the VT-HACD controller product line for hydraulic axes. The controller cards VT-HACD-l, VT-HACD-DPC, VT-HACD-DPQ, VT-HACD-B and VT-VPCD are said to combine hydraulics with digital closed-loop control technology and integrate the axes easily and comfortably via common field bus systems into decentralized control architectures.

boschrexroth.ca Info Card 369

Compact gear drives

The TP+ gear drive from alpha gear drives is said to offer low backlash and high torsional stiffness, combining to create what is said to be superior positioning accuracy, even in the micro range. In addition, the unit is also said to achieve substantially more torque than other alternatives. This performance boost is facitated by an innovative tooth design that also contributes to smooth running.

alphagear.com Info Card 370

Adjustable linear pitch

The Amacoil/Uhing has announced its model RS linear drive now offers a wider range of linear pitch settings for improved versatility and functionality in meeting linear motion application requirements. The change to linear pitch requires no re-gearing or adjustment to motor speed. Linear pitch, or the distance moved per shaft revolution, may be specified at 0.1, 0.2, 0.3, 0.4 or 0.5 times the shaft diameter that is based on thrust requirements. Depending on size, RS drives achieve linear speeds of up to 5 fps over distances of up to 13 ft. Axial thrust is up to 500 lb and repeatable accuracy is to within ±0.0004 in., depending on the type of controls used.

amacoil.com Info Card 372

Digital servo drives

The Electromechanical Automation Division of Parker has announced two additions to its Compax3 line of digital servo drives. The new power levels increase the line's output capacity to 10 and 15 A_{rms}. A total of eight power levels are now available ranging from 300 W up to 20 kW of continuous motor shaft power. Features include auto-tuning, internal function generator on all units, support for Stegmann single- and multi-turn absolute encoders to dispense with limit switches and homing routines, and many control levels.

parker.com Info Card 379

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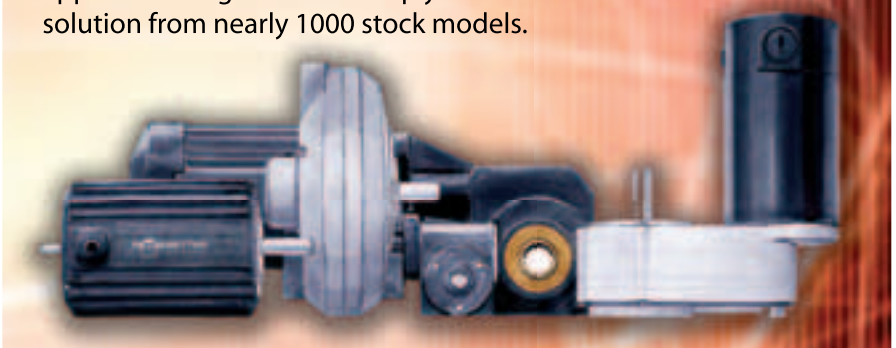

Featured Product

e-TORQ BRUSHLESS SERVO MOTOR
Whether you call it detent torque, reluctance torque, or cogging, the new e-TORQ brushless servomotors eliminate it. These motors produce peak torques up to ten times rated torque, eliminating the need for gearboxes in many applications. And unlike some direct drive solutions that are limited by top speeds of several hundred RPM, e-TORQ offers a speed range from 1 to 6000+ RPM.

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Info Card #24

Products: Motion Control

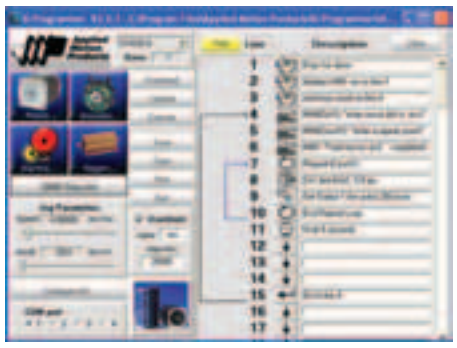
A/D interface for encoders

Heidenhain Corp. has introduced the EIB 192 External Interface Box for motion control encoder signal transmission. By changing 1 V_{pp} encoder signals to an EnDat 2.2 bidirectional digital interface, the EIB box changes its signal from analog to digital, said to be a huge advantage to machine builders wanting to standardize on one encoder interface. To do this, the interface box will convert sine/cosine signals to EnDat 2.2 (a digital bi-directional interface for encoders that also updates information stored on an encoder). The input frequency is 400 kHz or less.

heidenhain.com Info Card 390

Steppers, servos software

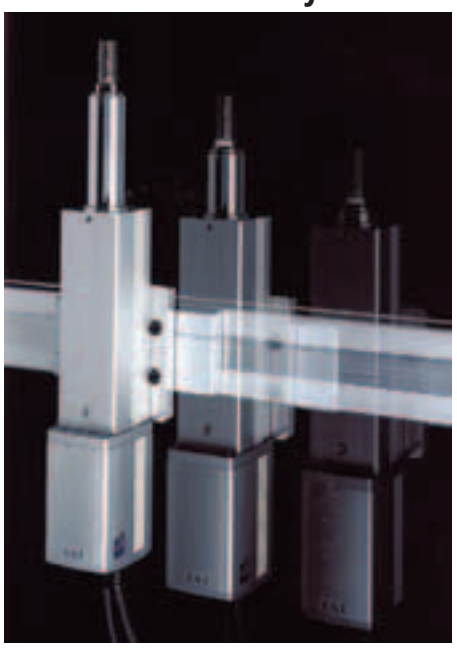
Applied Motion Products has announced its Si Programmer Windows-based software version 2.5.14. The software supports seven Si- compatible stepper drives, including the STAC6 drive, as well as three Si- compatible servo drives. Si (Simple Indexer) Programmer is said to provide "out-of-the-box" use with integrated tuning for intuitive programming and a graphical interface that combines motion, I/O and operator interface functionality



for simple machine sequencing. Si-compatible drives are also said to easily integrate with other devices such as sensors and PLCs.

applied-motion.com Info Card 378

Electromechanical cylinders



IAI America Inc. has introduced the Robo Cylinder line of electric linear actuators. The ballscrew linear actuator offers multiple positioning, ±.02mm repeatability, programmable velocity control, programmable acceleration and deceleration, programmable torque control (push function), 50 to 1000 mm stroke lengths, 1 to 1000 mm/s speed, serial I/O for linking up to 16 axes, and a life expectancy up to 5000 km.

intelligentactuator.com Info Card 374

USB data acquisition

Data Translation has released the DT9800 series, said to be the first true USB (Universal Serial Bus) products for high-performance data acquisition. The series includes the capabilities of PCI plug-in boards in easy-to-use, compact modules. Featured are 12- or 16-bit analog inputs, 100 kS/s throughput, digital I/O, counter/timers, plug-and-play with one included cable, and hot-swapping capability 500 V isolation.

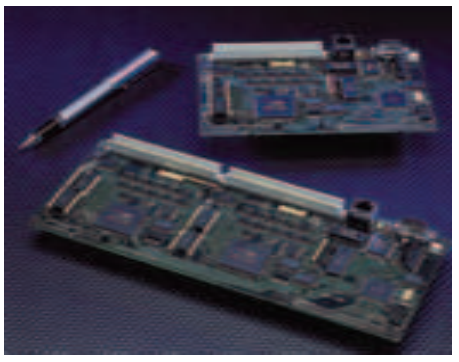
datatranslation.com Info Card 376

Servo with power supply

Danaher Motion has introduced the Kollmorgen S300 series servo drives. Units feature a built-in power supply and, along with the S600 series, offer 1.5 to 70 A, 115 to 480 Vac operation and are available as drive-only or with a single-axis control card within the same package, along with a wide array of built-in capabilities to perform complex motion tasks.

kollmorgen.com Info Card 375

Ethernet motion controller



Galil Motion Control has introduced the card-level, DMC-21x3 Ethernet motion controller, which incorporates a 96-pin DIN connector while eliminating the need for cable between the controller and interconnect board. The 3.70 x 4.25 in. DMC-21x3 series includes many high performance features of the company's Optima Series DMC-21x0 32-bit microprocessor controllers, such as 1- to 8-axis control of step or servomotors, 10-BaseT communications with RS232 port, and various modes of motion.

galilmc.com Info Card 377

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Info Card #26

Products: Motion Control

Linear encoder program

Heidenhain Corp. has announced updates and enhancements to its linear encoder program, including two interfaces – EnDat 2.2 and FANUC 02. New encoders are the LC 183 and 483 series with EnDat interface, and the LC 193 and 493 with Fanuc interface. The encoders are said to make purely serial axis-control possible. The resolution of the absolute position value is 5 nm for encoders with an accuracy grade of ±3 µm, and 10 nm for encoders with an accuracy grade ±5 µm with the EnDat versions.
heidenhain.com Info Card 412

Constant torque system

Constant torque applications require motors that can continuously produce full load torque at low speeds, according to V.J. Pamensky Canada Inc. The company adds that conventional methods of over sizing the motor or adding a blower can be replaced by using a standard WEG motor and WEG CFW09 drive. A NEMA Premium Efficiency TEFC WEB motor can provide a 1000:1 speed range with the CFW09 inverter. WEG motors include a 1.25 service factor up to 100 hp (1.15 >100 hp) as standard. The CFW09 control panel includes a jog keypad as standard.
pamensky.com Info Card 413

Compact brush dc motor

Brush dc motor from Magmotor suitable for X-Y positioning systems, medical equipment, pharmaceutical equipment, machine tool spindles and centrifuge applications, has the ability to accelerate rapidly with limited impact to the system. It features internal brushes and Nd magnets.

The 1.5 in. diameter design produces a continuous torque up to 25 oz in., and a peak torque up to 150 oz in. A variety of electrical and mechanical options are available.
magmotor.com Info Card 414

Low-inertia servo motors

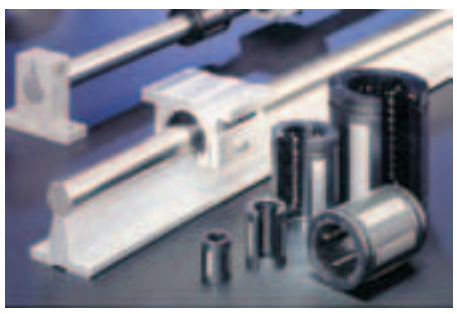
Rockwell Automation has announced the addition of two frame sizes to the Allen-Bradley MP-Series Low Inertia servo motor line. The MP-Series Small Frame servo motors are dynamic motors with environmentally sealed connectors. Frame sizes of 63 and 75 mm have a motor designed for supply voltage up to 460 V with a continuous stall torque range from .26 to 2.1 Nm.
ab.com Info Card 415

Patented servo drive system

YET US Inc.'s XtraDrive servo system features patented NCT control technology.

The adaptive control structure is said to eliminate difficult and time-consuming system re-tuning by automatically accommodating changing load requirements. The complete servo system includes an integrated amplifier with embedded 1.5 axis controller. The system operates as a stand-alone unit or can be driven by an external PLC or multi-axis controller for step and directional input, analog velocity or torque control and networking capability.
yet-motion.com Info Card 416

High capacity slide systems



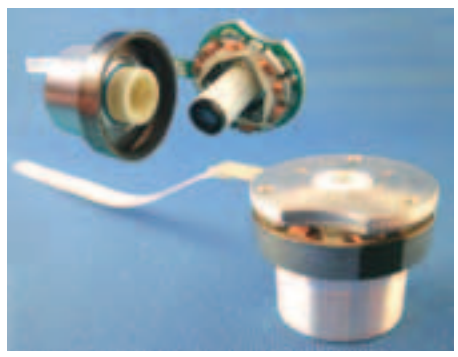
NB Corp. TOPBALL slide products are said to offer 27 times more travel life to automation equipment, machinery, optical and measuring instruments. The line of slide products is available as total systems or as individual components such as slide bushings, housings and slide shafts.
nbcorporation.com Info Card 417

Time delay relays

AutomationDirect has announced additions to its line of relays. The AD-70-STM-1 Socket Timing Module converts 783 and 784 series relays to time delay relays, creating a what is said to be a cost-effective alternative to integrated timers. The module has selectable time scales ranging from

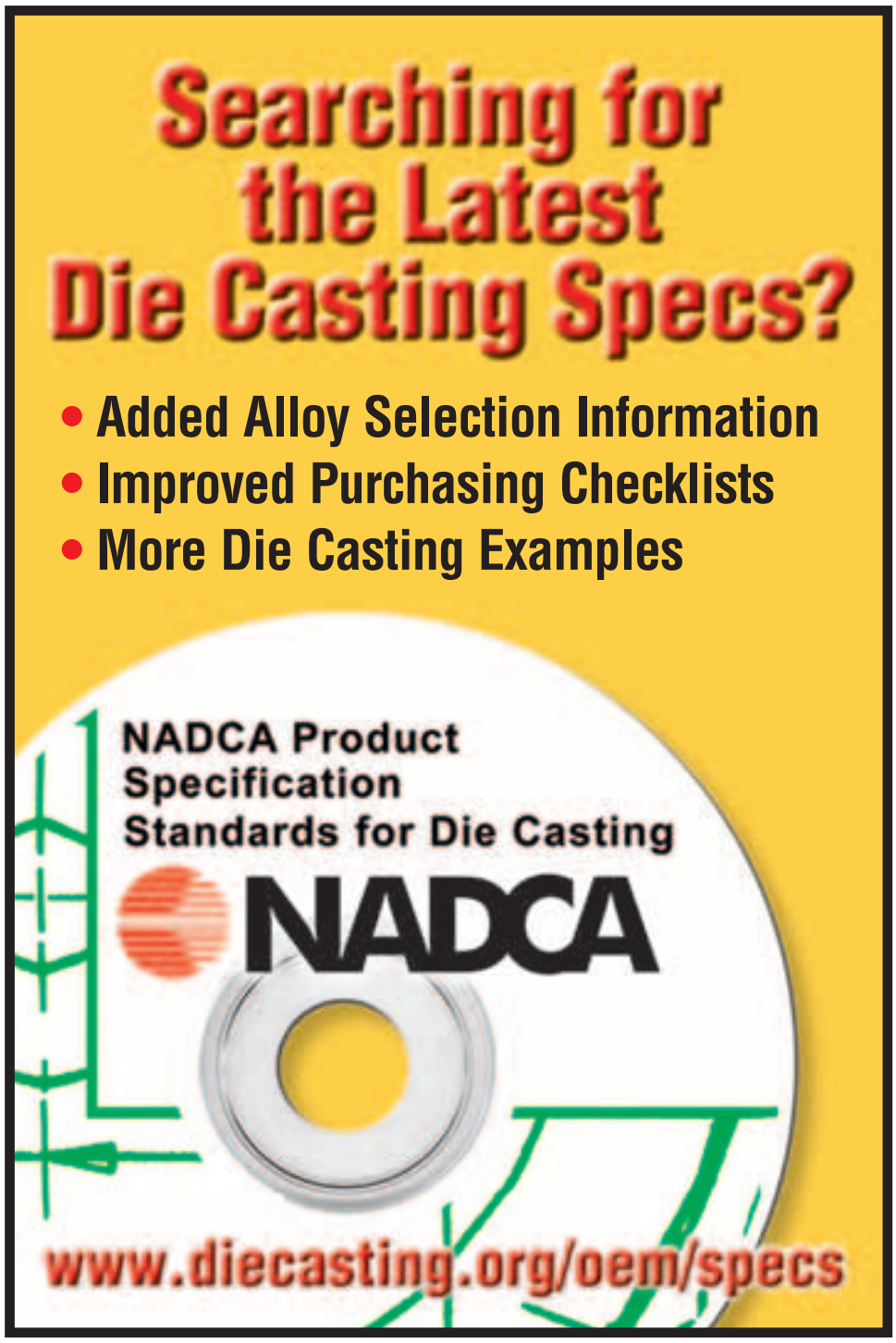
0.1 s to 10 days and can be adjusted with the built-in potentiometer.
automationdirect.com Info Card 418

Micro brushless motors



Sanyo DC Micro Motor Division has developed a micro motor featuring a ceramic air bearing design. The PM series brushless motor design uses air as a lubricant with the sleeve and shaft of the ceramic air bearings containing a 3- to 5-micron gap between them. At the top of the shaft, magnets repel each other, and once the motor starts spinning, static air pressure is created in the gap. This allows the motor to operate without contact between the sleeve and the shaft. Available in a 20 mm size.
sanyo.com/industrial/ Info Card 419

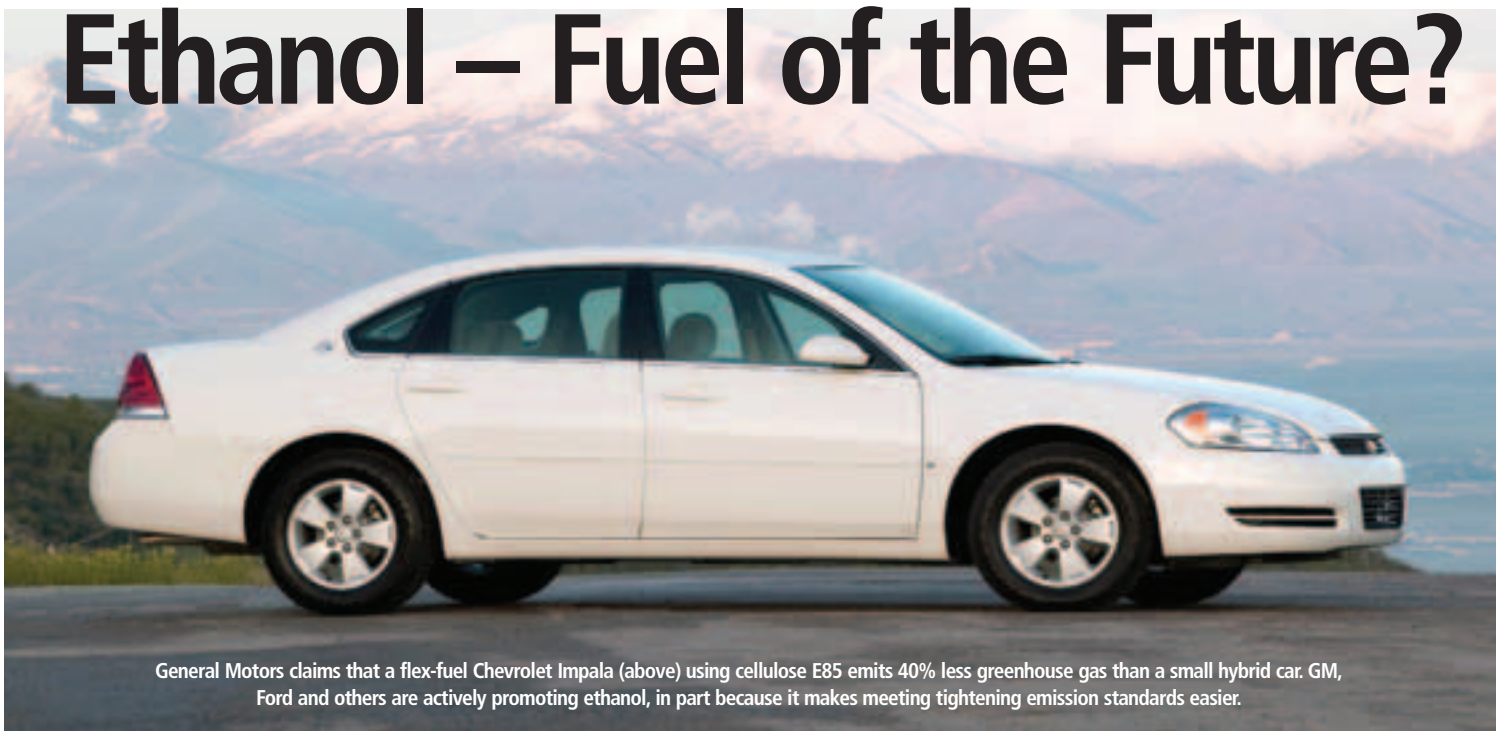
Info Card #27



Info Card #28

Automotive Scene

Ethanol – Fuel of the Future?



General Motors claims that a flex-fuel Chevrolet Impala (above) using cellulose E85 emits 40% less greenhouse gas than a small hybrid car. GM, Ford and others are actively promoting ethanol, in part because it makes meeting tightening emission standards easier.

By Bill Vance

With crude oil around $75 per barrel, possibility headed for $100, and gasoline at over $1.00 per litre, growing our own motor fuel takes on renewed urgency. The fact that it's greener and cleaner is a bonus. Not surprisingly, the Government of Canada is poised to implement a national program requiring 5% biofuel by 2010, so we'll be pumping ethanol (wood ethanol) into our fuel tanks before long. With some adjustments the transition can be accommodated by the existing gasoline distribution infrastructure.

Cold weather can cause harder starts

For gasoline engines this will be a mixture of ethanol and gasoline ranging from E10 (10% ethanol and 90% gasoline) to E85 (85% ethanol). Ethanol as motor fuel is not new, having been used in North America on a limited basis for many years, and sugar cane- based ethanol now powers 70% of Brazilian vehicles. What is new will be its mandated use here.

Extending gasoline with ethanol is being driven by several factors, including the rising cost of crude oil, the instability of some oil producing countries, the desire to decrease or eliminate imported oil, the goal of arresting global warming by reducing emissions, and government mandates. An underlying theme is that it would subsidize and/or support the agriculture industry, and given the rural vote distribution bias, the government has a vested interest.

Canada, of course, has extensive oil sands reserves, but processing it takes huge amounts of natural gas and water, making it an expensive form of oil. If more conventional oil prices fell significantly oil sands oil may not be economically viable.

Corn kernels are the typical source of ethanol in North America, but corn is an expensive crop and may not be cost effective. Researchers at Cornell University in Ithaca, New York, and Berkeley University in California have concluded that producing corn ethanol is cost negative, i.e., it takes more fossil fuel energy to farm, transport and process a litre of ethanol than the ethanol contains.

Others, including the United States Department of Energy's Argonne National Laboratory in Illinois, have just as persuasively argued that ethanol has a positive energy balance; Argonne says it contains 67% more energy than it consumes.

Iogen Corp, an Ottawa-based biotech company feels the better approach to ethanol is from non-food cellulose materials such as cereal straw or corn stover.

Ethanol is a cleaner fuel than gasoline; Berkeley estimates it produces 13 % less greenhouse gas per BTU, although the U.S. Department of Energy puts the figure at only 4% for E85.

A slight downside to ethanol is that it can cause harder starting in cold weather. And ethanol has about 30% less energy in BTUs than gasoline, meaning more litres per 100 km, converting to a 25% shorter driving range on a tank of E85.

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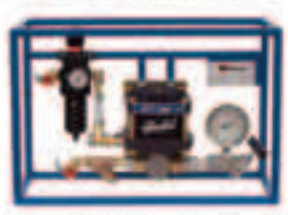

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Info Card #31

Feature: Hydraulics & Pneumatics

Non-spill coupling fits bill for HP bulk ink delivery

Hewlett-Packard (HP) brings innovation to package printing through its Specialty Printing Systems division (SPS). SPS focuses on helping companies integrate HP's thermal inkjet (TIJ) technology and products into their printing systems.

When SPS was developing its Versatile Black Bulk Ink System, a robust and flexible bulk ink delivery system for high-volume print runs used in industrial packaging applications, it turned to Colder Products Company (CPC) for its quick disconnect connection.

Secure connections avoids messy ink spills

After investigating a number of off-the-shelf fluid connectors from different sources, the HP engineering team selected CPC's NS4 Series Non-Spill Coupling. The component provided the reliable, easy-to-use, low-cost connection the team needed. "We suggested using a coupler with a non-spill shut-off valve," said Andy Hass, Industrial Business Unit Manager, CPC. "This augmented the product design by helping to avoid messy ink spillage when the coupler is disconnected."

The Versatile Black Bulk Ink System is designed for companies that execute large print runs and have a need for a high-volume ink delivery system. "Our recently developed Versatile Black Bulk Ink System extends the capabilities of Hewlett-Packard's TIJ 2.5 printing platform," said Daniel L. Briley, Engineering Manager, HP Specialty Printing Systems.

HP's Versatile Black Bulk Ink System is a robust, advanced bulk ink delivery system that offers superior print quality, low cost per copy, and minimal user intervention. The system offers design engineers the opportunity to configure almost any combination of HP Q2320A printheads and HP Q2321A bulk ink supplies to achieve the desired print capability. The HP Q2320A printhead also produces high-quality, water-fast, and crisp output with a 600 dpi resolution from 300 nozzles. The system uses black pigmented aqueous ink in large volume ink supplies (350 cc) that can print on a wide range of substrates, including kraft, corrugated, and clay coated.

The industrial bulk ink delivery system is widely used for mail addressing, mail postage, carton coding, barcode printers, and many industrial applications that require long production runs, low cost per imprint, and reliable, user friendly printing systems.

The mechanical connections between the regulator assembly and the printheads are essential parts of the ink delivery system. Connections that are not secure or spill-proof can lead to messy ink spills when disconnected and require increased operator involvement. The result can be costly job downtime. The SPS design team approached CPC to develop customized couplings for the new system that would minimize connection concerns and improve the serviceability of the printheads and ink supply system

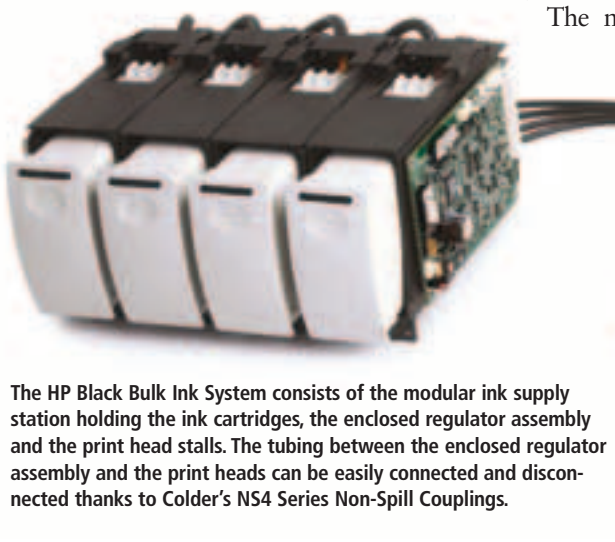
Colder Products Company's NS4 Series Non-Spill Coupling Series features a non-spill shut-off valve that enhances operator safety and speeds connection time. The NS4's olefinic overmolding increases the durability of the connection and provides a better grip for users. The overmolding is also used for color-coding, which provides instant visual differentiation of diverse media lines.

"The CPC experts worked very closely with our engineers to create a custom product that met our needs and strengthened our entire system," said Briley. "This strong partnership has enabled us to meet our cost, performance, and schedule targets, and offer a superior solution by virtually eliminating the potential for spills"
The HP Bulk Ink Delivery System allows for a bulk ink supply to be connected to one or several print cartridges. A fluid regulator system enables the ink supply to be located in virtually any location convenient for the printing system, and still maintain reliable and controlled ink delivery to the print cartridges. The modular ink supply station is linked through flexible tubing to the enclosed regulator assembly, which maintains pressure and ink flow. Flexible tubes again connect the enclosed regulator assembly to the individual printhead stalls holding the printheads. The tubing between the enclosed regulator assembly and the printheads can be easily connected and disconnected thanks to the innovative CPC NS4 Series Non-Spill Coupling. The NS4 features a non-spill shut-off valve that is ideal for use in ink handling applications. In addition to minimizing spills, the valve also automatically reduces air inclusion or trapped air that may lead to print quality problems and expensive system delays and maintenance.

"One feature that makes our couplings unique is an easy-to-use thumb latch to allow for secure, single-handed operation," said Hass. "An audible "click" confirms that a secure connection is made and assures a secure seal." The intuitive design of the NS4 makes it so simple that no tools are required to connect or disconnect the tubing and special training is not necessary for regular operation of the thermal inkjet system.

This article was supplied by Colder Products Company (colder.com) of St. Paul, MN.

Info Card 321



The HP Black Bulk Ink System consists of the modular ink supply station holding the ink cartridges, the enclosed regulator assembly and the print head stalls. The tubing between the enclosed regulator assembly and the print heads can be easily connected and disconnected thanks to Colder's NS4 Series Non-Spill Couplings.

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Info Card #33

Pneumatic valve terminals engage in digital dialog and diagnostics

Sporadic faults can be detected by either laborious local analyses or by reading out the CPX diagnostics trace.

Valve terminals are among the most important industrial communication and installation systems. They link the worlds of pneumatics and electronics for machine-level diagnostics.

For example, Festo's CPX concept already includes basic diagnostics functions, which can be used without the need for further investment. Machines can be monitored from a central point, with configuration and fast diagnostics via existing networks and an integrated Ethernet interface as a meeting point for the two worlds of automation and information technology.

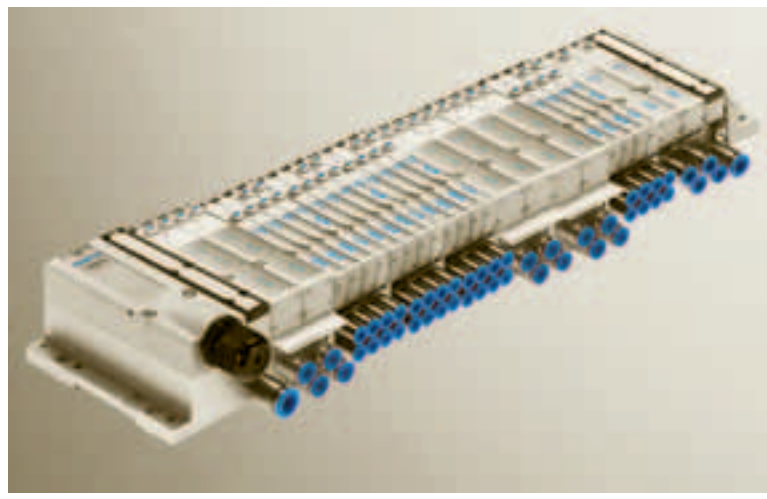
Diagnostics is the key to better productivity. CPX/MPA opens the door to:

- Modular diagnostics services, including custom-configured CPX/MPA-modules that can be selected with or without high-level diagnostics, and, within the modules, only those diagnostics features that are actually required in the installation are activated. The data provides an immediate indication of the causes of faults and measures required.
- Module- or channel-oriented diagnostic I/Os
- Valve diagnostics per channel
- Local open text
- Additional Ethernet interface
- Remote maintenance, e-mail or SMS alarm

Diagnostics is the key to better productivity

There is a world of difference between the time it takes to produce an installation and the length of time for which this will be in operation. While machine constructors would allow roughly three months for system design and installation, the planned operating life of an installation with the end user could be eight to ten years – including maintenance, modernization and a great deal of downtime. But when it comes to diagnostic functions, developers are wary of the costs of these, which may amount to 30% of total programming costs.

Peripheral devices such as CPX/MPA can help reduce downtime with tailor-made integrated diagnostic services. In this way, integrated diagnostic functions can be provided at relative low cost in terms of time. Thus, if availability can be improved from 90 to 92%, this means a saving of no less than $2.86 million each year on the basis of a production volume of $143 million – demonstrating that the total cost of ownership is well worthwhile!



The MPA valve terminal provide serial interlinkage, up to 128 valves and diagnostics services.

Until now, remote maintenance concepts have simply been concerned with gathering data from machines and transmitting this to a central point. Here, it has often been unused and without a purpose in "data graveyards."

Interpretation and evaluation of data of this kind is, however, vital for preventive maintenance. Previously, it was possible to monitor only on-line controller functions, with no possibility of looking into machines until an actual fault occurred.

Many users find the task of making this increasingly complex diagnostics data quite daunting.

Certainly direct diagnosis reduces costs. The atmosphere in the case of installation breakdown, resulting in downtime, is hectic. For example, if a technician knows via an SMS that a short circuit is present in module 5, channel 2, he or she can localize the defective component with just a few mouse clicks, pack the right spare part and quickly set about remedying the fault in question.

This may sound futuristic but is already reality with modern valve terminals such as the CPX/MPA.

Faults that are present now are obvious to everyone: The relevant LED lights up, the corresponding bit is set. CPX/MPA offers several channel-oriented LEDs on each I/O module, while on valves there are even two-color LEDs for status/ fault display.

The faults of tomorrow will be localized via a CMS (condition monitoring system). By counting numbers of cycles, it will be possible to determine whether maintenance will soon be required on the mechanical components connected to a cylinder. An integrated valve ASIC on the CPX/MPA will provide this counter function and generate a warning automatically – for specific channels and up to 128 valve coils.

This article was excerpted from "trends in automation 6" magazine published by Festo Inc.

Info Card 327

Info Card #34

Info Card #35

Products: Hydraulics & Pneumatics

Compact pneumatic valves

The LS04 pneumatic valves from Bosch Rexroth Canada are 10 mm wide and come in three different designs. Units include a miniature valve with optimized dimensions and a flow rate of 200 l/min, a standard valve with 250 l/min and a valve terminal system with a flow rate of 330 l/min. All valve variants are made of plastic. The sealing system is the same as that already used in the company's HF04 valve series. Users can implement mixed configurations with single and double solenoid or double 3/2-way valves.

boschrexroth.ca Info Card 346

Variable volume pumps

The VPPL series of industrial variable volume piston pumps from Duplomatic Hydraulics offer features such as a maximum volume stop and an optional range of operating controls. The controls include pressure compensation (PC5), pressure and flow control (load sense PQC) and remote pressure compensation (PCR) that will allow proportional pressure control over the full range. Available in 5 sizes, units produce 4, 8, 10, 16 or 21 gpm at 1725 rpm and all sizes have operating pressure to 3000 psi continuous. Operating speeds are 500 to 2000 rpm.

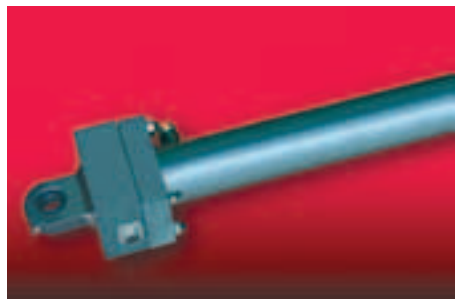
uhiltd.com Info Card 349

HGPC parallel gripper

The HGPC parallel gripper from Festo incorporates a half-shell design that integrates into the company's modular handling and assembly system. Features include: 12, 16, and 22 mm sizes; gripping force per finger at 6 bar of 25, 45, 70 N; self-centering double-acting piston drive; working pressure of 3 to 8 bar; max. working frequency of 3 Hz; opening/closing time of < 100 ms; and, a service life of up to 10 million operating cycles.

festo.com Info Card 350

Position-sensing cylinders



Energy Manufacturing Company offers an electronic position-sensing option for nearly all of the custom welded hydraulic cylinders it designs and manufactures, including bores to 10 in., strokes to 15 ft, and working pressures to 10,000 psig. Positioning accuracy is ±.005 in. or better, depending on cylinder stroke length and other design parameters.

energymfg.com Info Card 353

Continuous running pumps

Series 8003 WOB-L piston pumps from Thomas Products are suitable for continuous running. Available for both pressure and vacuum applications, the pumps use Teflon piston seals, heat-resistant plastic housings and elastomer valves. Open flow is 3.0 l/min. Maximum intermittent pressure is rated at 2.0 bar with continuous pressure to 1.6 bar. Maximum vacuum rating is -590 mbar. The pumps measure 2.1 x 1.2 x 3 .2 in. They are available with 6, 12 or 24 Vdc Class E insulated motors.

rtpumps.com Info Card 354

3-way pilot solenoid valve

The Lee Company's miniature 3-way High Flow Piloting Solenoid Valve is available in a single coil configuration, weighs 4 oz and uses 7.8 W at 28 Vdc. Operating pressure is 3000 psi, and minimum flow at that pressure is 4.0 gpm. The use of the patented Lee Multi-Seal is said to to eliminate conventional O-rings and back-up rings, and simplifies port layout by allowing two ports to be sealed in the same axial plane.

theleeco.com Info Card 355

New Closed Circuit Video System

Enhanced Visibility/Safety for Off-Highway and Heavy-Duty Vehicles.

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Vehicle safety, improved work tool effectiveness, and the ability to monitor supporting operations and personnel, are significantly enhanced with the new HydraForce CCV system offering up to three remote viewing positions using three cameras.

The switching module provides automatic view rotation for multi-camera systems, minimizing operator input and distraction, while offering manual override capability. A large 7" color LCD monitor displays a sharp, clear image which automatically adjusts brightness for changes in cab illumination.

Extremely rugged, compact cameras provide a panoramic view spanning up to 115 degrees. The cameras have been tested and proven to survive the harshest environments, unaffected by extreme levels of vibration, cleaning with high pressure wash, even immersion in one meter of water!! An internal heater automatically turns on when the temperature drops, quickly removing condensation, even snow and ice, from the camera lens. The photochromatic lens darkens automatically when exposed to ultraviolet light.

This new closed-circuit video system is part of the HydraForce family of electronic systems and components providing full vehicle electronic control and security for heavy duty off-highway applications.

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- Photochromatic lens darkens automatically when exposed to ultraviolet light.
- Switching module for up to three cameras.

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Info Card #36

Products: Hydraulics & Pneumatics

Vacuum generators

Anver Air Powered Vacuum Generators include a line of single- and multi-stage pumps, ejectors and flow tubes that operate on the venturi principle using plant supplied compressed air. Featuring no moving parts, units are offered with various combinations of flow rates from 1 to 400 cfm and vacuum levels from 1 to 27 in. Hg, in different ratios and constructions.

anver.com Info Card 356

Chip collector magnets

Plastalloy chip collector magnets from The Electrodyne Company Inc., capture metal filings, chips and other ferrous materials which would otherwise damage downstream hydraulic components. The flexible magnets work in temperatures to 150ºC, are oil resistant, and are suitable for most hydraulic fluid recirculation applications. Pressure-sensitive adhesives are available to hold the magnets in place. The magnets are available in sheets, strips or die-cut shapes.

edyne.com Info Card 357

30,000 psi portable system

Maxpro Technologies has introduced a portable Power Pack system capable of producing outlet pressures to 30,000 psi and designed for applications where mobile hydraulic power is needed. The 12 x 16 x 20 in., 44-lb air driven system requires no electrical power and is explosion proof. In addition to hydraulic power, the system can pump pure water or chemicals. Systems feature a Maximator flow pump with a pressure ratio of 300:1 and maximum outlet pressure of 30,000 psi from 100 psi shop air pressure.

maxprotech.com Info Card 351

Open loop, axial piston pump

The Oilgear Company's PVWH open loop, axial piston pump is available in 10 different sizes and reaches a maximum pressure of 5000 psi. Featuring 11 types of controls, the pump allows for field interchangeability without disconnecting from the drive or system piping. Features of the pump include: valve plate ported rear or top and bottom; all sizes are below 80 dBa at all pressures; SAE rated shaft; speed up to 3000 rpm; maximum pressure of 5800 psi; and, theoretical maximum displacements ranging from 0.66 to 7.94 in^3/rev.

oilgear.com Info Card 348

Hydraulic pump motors

The Parker Hannifin Hydraulic Pump Division has added four displacement sizes to its line of heavy-duty, fixed-displacement, piston-type bent-axis motors, expanding the product offering to a total of 14 different models. The new units are the F11-12 with a displacement of 12.5

cm^3/rev; the F11-14 with a displacement of 14.3 cm^3/rev; the F12-90 with a displacement of 93 cm^3/rev; and, the F12-125 with a displacement of 125 cm^3/rev.

parker.com Info Card 347

Feature: CAM

Graphical software and HMI:
System simplifies gear manufacturing

The France-based NUM Corp. offers a line of control systems suitable for all aspects of gear manufacturing. Configured with a CNC, motors/drives and user-friendly software, these "off the shelf solutions," can be used in new machines or to re-control existing machines.

With data fields, program is automatically generated

The embedded machining cycles for gear hobbing, shaping or grinding and automatic gear/tool alignment are governed by a menu-driven Human Machine Interface (HMI). The NUM gear control systems saves the OEM or integrator years of software development, while reducing the cost of employee training. They are suitable for the production of any size or type of gears at a reasonable cost.

The PC- or CNC-based HMI allows the operator to program the machine without knowledge of ISO code programming. The operator is guided by pictorial information and questions presented on the screen. Entry screens provide the machine operator with a comprehensive graphical approach that depicts the hob or grinding wheel, the gear, and associated setup data in a clear and concise manner. He or she simply fills in the data fields presented in the screen. After this data entry session, the program is automatically generated, stored, and it is ready for execution. Online step-by-step video tutorials and graphical simulation further facilitates the operation. In addition, the operator can combine graphical programming with ISO programming or use one or the other individually, if desired. NUM application engineers familiar with gear manufacturing are available to help with system integration and technical support.

Two system packages are available. With the Simple Electronic Gear Box package, the CNC synchronizes cutter rotation and axial tool motion (Z axis) with the rotation of the work piece (C axis). This configuration is principally designed for the simplest machines with three axes (X, Z, and C) and a spindle.

With the Full Electronic Gear Box package, the CNC adds tangential tool movement (Y axis) to the synchronization of the Z and C axes. This configuration is designed for applications with up to six axes (X, Y, Z, A, C, and W) and a spindle, allowing for manufacturing of bevel and helical gears with straight or conical cutting tools.

NUM gear manufacturing features:

- Simple Electronic Gear Box – a high-speed control link to drive worktable (C) from tool or axial (Z) input;
- Full Electronic Gear Box – high-speed control link to drive worktable (C) from tool, axial (Z) or tangential (Y) input;
- Automatic Gear Alignment – rapidly aligns the hob or grinding wheel (tool) to a gear (or work piece), which already has teeth;
- Operator prompted teach routine to find first gear; and,
- High speed Interface to tooth edge sensor to store gear image.

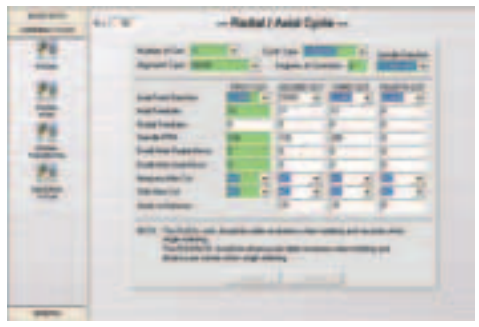
Interactive programming includes:

- User-friendly Windows based interface
- Library of tools (straight hob, tapered hob, or milling cutter)
- Automatic hob shift management
- Helical, spur and worm gears
- Tooth modifications (crown or taper)
- Tooth alignment to another gear on the same shaft
- Radial axial hobbing cycle (up to 4 cuts)
- Tangential or diagonal hobbing cycle
- Integrated context sensitive help file

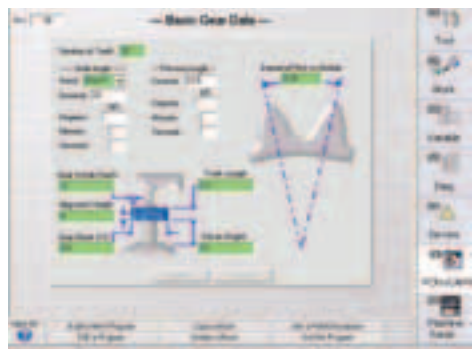
The gear alignment option provides cutting tool and gear re-synchronization, via a non-contact sensor, allowing for automatic "tool-work piece" timing pickup, when reintroducing a precut or hardened gear into the machine.

This article was supplied by NUM Corp. (num.com).

Info Card 398



Radial and axial data entry screen



Basic gear data entry screen

Straight hob data entry screen

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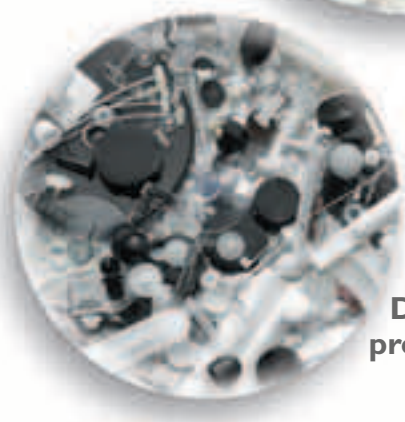

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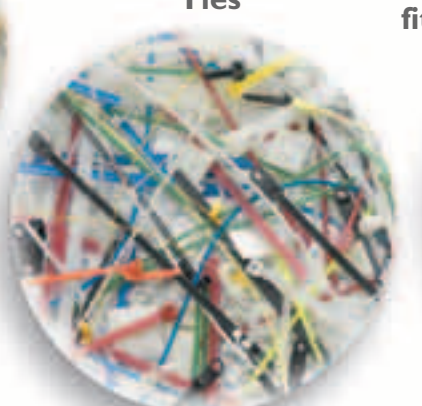

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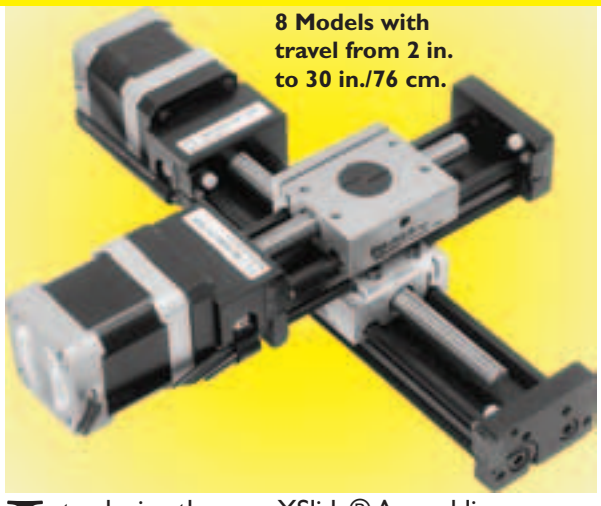

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Info Card #40

Medical Engineering

Back Tracking research at the University of Alberta

Vertebrae are bony elements that are separated from each other by a cartilage, a sort of spongy spacer that serves as both gasket and shock absorber.

By Mark Sunderland

Back pain is a major cause of lost time in the work place, striking the sedentary bureaucrat as likely as the manual laborer.

The spine, or backbone, is the articulating column that starts at the base of the skull and continues down to the pelvis. It consists of 33 irregular shaped bones with a hole through the middle for the spinal cord. The bones are called vertebrae, bony elements that are separated from each other by a cartilage (a sort of spongy spacer that serves as both gasket and shock absorber).

The spine is the main conduit and protective shell for the spinal cord – the nerves from the brain to the limbs. But unlike mechanical systems that have instrument panels to warn us of impending problems, the human body warns us with pain.

Some understanding of back pain has been gleaned by the measurement of spinal disorders. However, plain film radiography is invasive and has poor resolution while magnetic resonance techniques have difficulty capturing dynamic joint movements due to lengthy sampling times.

Surface-based transducers used in "range of motion" testing cannot assess movements of singular vertebrae, only of spinal regions, and finally, surgical techniques, which track objects inserted into singular vertebrae, are impractical for widespread use. Therefore, the true relevance between spinal mechanics and spinal function has remained unknown due to inadequate technologies or insufficient test populations.

Dr. Gregory Kawchuck and his research team at the University of Alberta are addressing this problem with the development of a novel ultrasonic technique for quantifying relative spinal motion. The process involves a non-invasive technique that can visualize internal load-deformation responses in real time.

Developed in the university lab, ultrasonic indentation uses an ultrasonic probe to locate an anatomic target of interest (vertebra) and is then advanced into the skin to load the target externally. The total testing time is approximately five seconds. By subtracting the probe's displacement from the change in the visualized target distance, internal tissue responses can be segregated into soft tissue deformation and vertebral displacement that occur within the plane of indentation.

Ultrasonic indentation uses an ultrasonic probe to locate a vertebra and is then advanced into the skin.

As a result, properties such as tissue stiffness and Young's modulus (calculating the behavior of material under load) can be quantified directly from tissues visible to ultrasound. From this and other related techniques, preliminary work has shown that stiffness measurements can be correlated to reports of low back pain, consequently enabling a graphic record and a tracking system for therapy. Pain is an inhibiter.

Even an aching tooth or an ingrown toenail can darken our disposition and sully the avenues of simple pleasure, but when our mechanical system is damaged, the probability of further injury is increased and the ability to fully protect our selves can be reduced by pain.

Studies have shown that relaxation and inactivity are not necessarily beneficial for relief. Gentle work, even with a little pain, is more likely to accelerate the recovery process, but as research such as that at the U of A continues to reveal a deeper understanding of back pain, the prospects for effective and efficient therapy will be greatly enhanced.

Mark Sunderland is president, Biomedical Industry Group, Ottawa (mark@biomedgroup.com).

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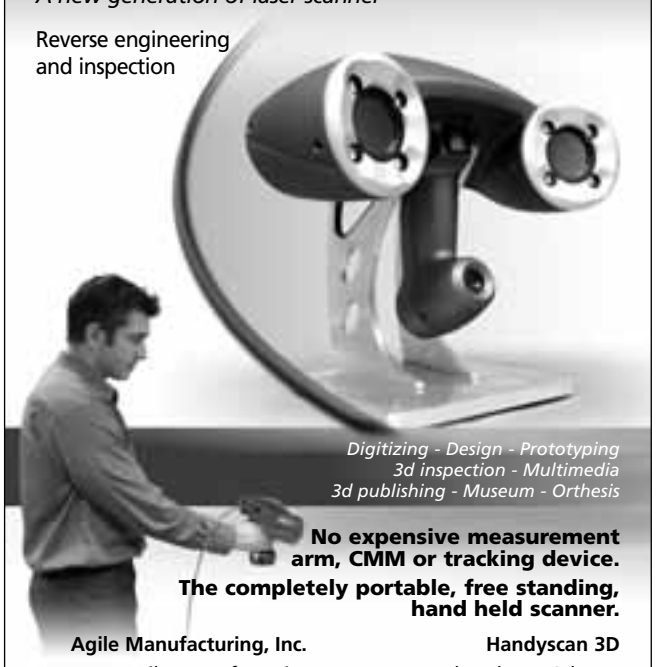

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This compact, complete and ready-to-use solution is perfect for applications requiring non-rotation. Constructed of durable, hard-anodized aluminum, the EF2 uses two outboard guide shafts, eliminating any twisting or spinning upon actuation to guarantee consistent performance.

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net exports	-355	-505	-485	-570	-700
Bearings Shipments by Type	**220**	**230**	**240**	**275**	**310**
Ball Bearings	120	130	140	160	180
Roller Bearings	60	60	60	70	80
Other Bearings & Parts	40	40	40	45	50

Bearings demand in Canada:

Forecast calls for 3.1% annual growth rate over the next four years

Sluggish manufacturing growth adversely affected demand for bearings in Canada from 2000 to 2005, according to World Bearings, a new study from The Freedonia Group, Inc., (freedoniagroup.com).

Although the Canadian bearings market is considerably smaller than that of the U.S., Canada is an intensive user of bearings (relative to such indicators as gross fixed investment and manufacturing value added) by global standards, notes the study from the Cleveland-based industry research firm. Bearings sales in Canada totaled US$725 million in 2005 compared to the US$8010 million for all of North America the same year.

Canada's motor vehicle manufacturing industry – which accounted for the largest portion of bearings demand in 2005 – has experienced declining output levels in recent years.

However, the market for bearings in Canada is forecast to climb 3.1% per year through 2010 to US$845 million, a turnaround from the 2000-2005 period but less than projected sales gains region-wide. Overall economic and manufacturing output will accelerate, and Canadian automotive production is expected to expand, spurring growth in related bearings demand through 2010.

Bearings shipments by producers in Canada totaled US$240 million in 2005, leaving the nation with a trade deficit equivalent to about two-thirds of domestic demand. Industry output levels have grown sluggishly since 2000, hurt by rising sales of low-cost imports. As would be expected, the U.S. is a major external supplier of bearings to the Canadian market.

Global demand for bearings is also expected to continue upwards

However, West European producers such as Germany, the UK and France are also major sources. Given the diversity of applications, most types of bearings are represented in the Canadian market in moderate-to-sizable quantities.

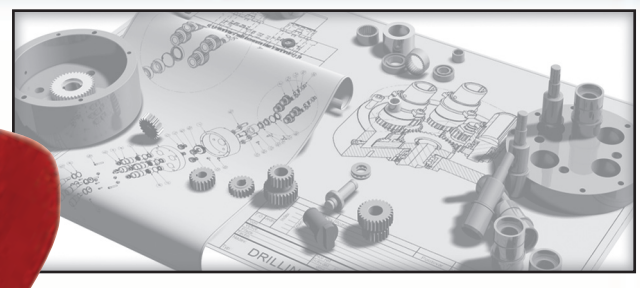
Shipments of bearings from facilities in Canada will rise at a slower rate than demand, growing 2.8% annually to US$275 million in 2010. Nevertheless, this represents an improvement from 2000-2005 industry performance, with local manufacturers benefiting from a pickup in bearings demand domestically and in key export markets. However, further inroads into domestic markets by less-expensive foreign-made bearings and a continuing shift in production to overseas locations by domestic companies will dampen shipment gains through 2010, and the country's trade deficit in these products will continue to expand. The Canadian anti-friction bearings manufacturing industry features much participation by the major multinational producers, including NTN, Schaeffler, SKF and Timken.

Global demand for bearings is projected to rise 5.5% annually to $42 billion in 2010, accelerating from the 2000-2005 period. Bearings demand will be stimulated by a pickup in world economic growth, increased fixed investment activity, higher manufacturing production, and rising aerospace equipment and motor vehicle output.

World Bearings (published 07/2006, 337 pages) is available for US$5300 from The Freedonia Group, Inc., 767 Beta Drive, Cleveland, OH 44143-2326.

Info Card 320

When you are IN THE ZONE, the target seems bigger because your focus is sharper.



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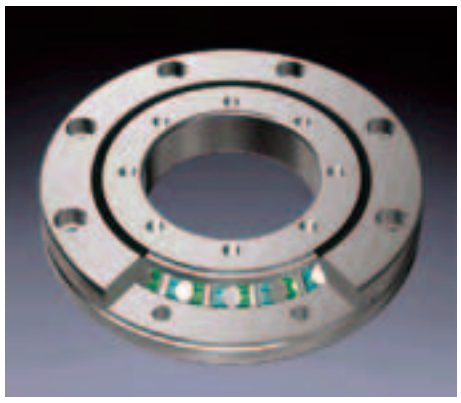
Info Card #47

Products: Bearings

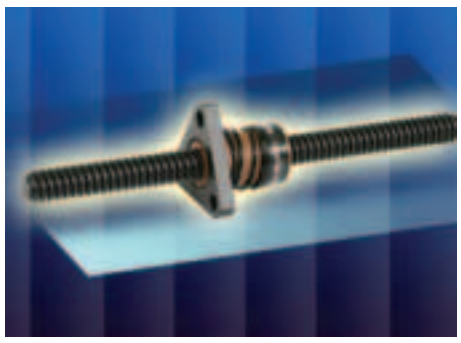
Cross roller ring configuration



The Type RU Cross Roller Ring from THK has a configuration said to result in an overall costs savings of up to 50%. Featuring mounting holes on both rings, the roller requires reduced parts and labor. The design allows for installation with either the inside or outside ring. Units are available in ID sizes from 20 to 350 mm and OD sizes from 70 to 540 mm. Roller pitch circle diameters range from 41.5 to 445.4 mm.

thk.com **Info Card 359**

Anti-backlash nut



Haydon Switch & Instrument has announced the "C" Series Anti-Backlash Nuts or Compression Style Anti-Backlash Nuts designed to eliminate the clearance between the threads of the nut and the threads of the leadscrew. The "C" style nut eliminates backlash by pushing the two nuts away from each other. Using a proprietary blend of self lubricating polyacetal in conjunction with rolled 303 stainless steel screw material, the nut is said to provide smooth operation throughout the life of the assembly.

hsi-inc.com **Info Card 362**

Plastic linear bearings

Igus Inc. has announced an alternative to re-circulating ball bearings and linear guides. DryLin linear bearings and guide systems are wear-resistant, self-lubricating, contamination and corrosion-free and have a low coefficient of friction. Four styles of linear guide systems include DryLin T, DryLin N, DryLin W and DryLin linear slide tables. DryLin T has an adjustable carriage made of clear-anodized aluminum and gliding elements made from iglide J polymer material blend.

igus.com **Info Card 361**

Info Card #48

Info Card #49

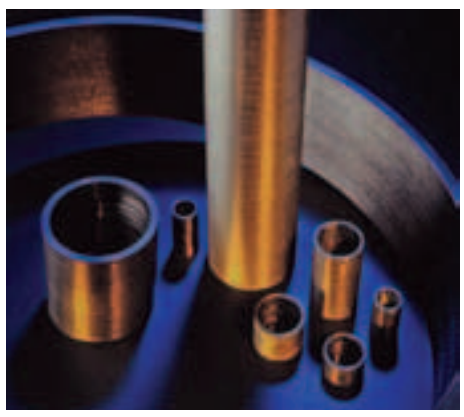
Products: Bearings

Motor bearing protection

The AEGIS SGR shaft grounding brush from Electro Static Technology prevent electrical damage to ac motor bearings and extends motor life by safely channeling harmful shaft currents to ground. Conductive microfibres inside the brush provide the path of least resistance for shaft currents to discharge to the motor frame. The brush is available in sizes to fit NEMA ac motors ranging from 1 to 1500 hp with shaft diameters from 8 mm to 153 mm.

est-aegis.com Info Card 365

Polymer composite material



Victrex PEEK polymer, a thermoplastic traditionally used in injection molding or extrusion, is suitable for some composite bearing applications. The polymer can be used as a matrix for thermoplastic composite pre-pregs made of carbon, glass or aramid continuous fibres. It is available in several viscosities including standard, medium and very low. The composites can withstand continuous operating temperatures of up to 260ºC in low stress applications, and 120ºC wet in aerospace structural applications.

victrex.com Info Card 366

Radial/axial combination

Max Rail combined bearings from LM76 can move over 41,000 lb on a linear bearing system that includes integrated 2 axis bearings, bearing flange plates, rails, and rail clamps in 11 sizes. The models range from the MX-53 bearing with a maximum dynamic load rating of 5395 lbf radial and 2248 lbf axial to the MX-63 bearing with a maximum dynamic load rating of 41,140 lbf radial and 18,434 lbf axial. Bearing rails are available in lengths to 19.7 ft.

lm76.com Info Card 363

Miniature bearings

Miniature bearings down to a size smaller than a paper clip are available from SPB-USA LLC, a subsidiary of Sapporo Precision Inc. SPB bearings are available in both corrosion resistant stainless steel and high carbon chromium steel, and are produced in a wide range of miniature sizes, as well as "extra thin" and flanged bearings in both medium and larger sizes.

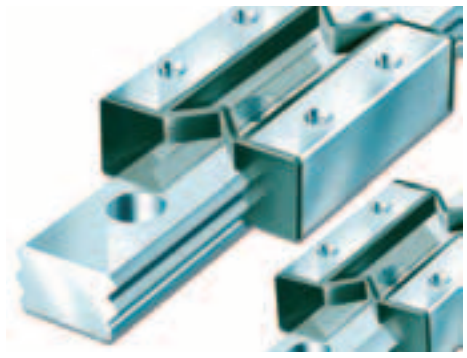
spb-usa.com Info Card 364

Torque overload devices

Emerson Power Transmission has added three products to the Browning torque overload device series: Browning Torq/Pro X and Browning Torq/Pro Z torque overload devices, and the Browning Axial Gard linear overload device. In addition, the Browning Torq/Pro product line has been extended to include six new models. It is an automatic reset torque overload device that has a bore range of 0.28 to 2.75 in., torque range of 1.25 to 578 lb ft and trip torque precision of ±3%.

emerson-ept.com Info Card 360

Linear guidance systems



Miniature linear plain guidance systems are ready-to-fit, maintenance-free guidance systems from the INA division of the Schaeffler Group. Units can support forces from all directions – apart from the direction of motion – and moments about all axes, operate largely free from stick-slip, have low wear and are insensitive to contamination.

ina.com Info Card 411

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Info Card #50

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Info Card #51

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- *150% overload for 60 s. / 175% overload for 2 s.*

Info Card #52

MOVIMOT® The smart gearmotor with its own integrated frequency inverter

- *Cost-effective, no separate inverter, no external wiring.*
- *Simplifies installation and maintenance.*
- *For gearmotors from 0.5 to 5 HP with input voltages from 380 to 500 VAC ±10%, or 0.5 to 3 HP with input voltages from 200 to 240 VAC ±10%, 50/60 Hz.*
- *Available in all SEW-Eurodrive gearing configurations, retrofittable.*
- *Decentralized or centralized control (one MOVIMOT® can slave up to 31 others).*
- *Allows for stepless speed optimization to replace multi- and variable-speed motors.*
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- *Robust surface-mount technology, durable water-tight metal enclosure, suitable for washdown applications.*
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Info Card #53

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- *Absolute encoder feedback (works with linear or laser-type encoder systems).*

Info Card #54

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Info Card #55

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Info Card #56

Products: Fasteners & Adhesives

Structural metal bonding

Henkel Corp. has introduced a line of seven structural acrylic adhesives that provide bonds to a variety of metals. Two-part Loctite Speedbonder structural adhesives bond aluminum, steel, and galvanized metals to a variety of substrates including plastics and composites. Loctite H4720 Speedbonder structural adhesive provides environmental resistance on a range of metals. H8000 fixtures in 10 to 15 min and provides impact and peel strength on aluminum surfaces. For high strength steel bonding, H8500 offers a short open time, while H8510 offers an extended open time for parts alignment. Finally, H8600 is formulated for long-term bond strength on galvanized steel, and offers bonds to many other metals exposed to environmental extremes.

loctite.com Info Card 308

PC cable and wire supports

EZ twist lock circuit board supports from Micro Plastics feature a locking base that snaps into the chassis by hand. Cables and wires can be loaded and unloaded with a twist of the fingers. The additional arm inside the twist lock can be used for holding smaller wires or bundles. Each part fits a .187 in. diameter hole and a panel thickness of .030 to .078 in. Parts are molded in natural nylon 6/6.

microplastics.com Info Card 309

Push-to-close rotary latches

The R4-30 series of Southco push-to-close rotary latches feature steel body construction, plus a triple-layer pawl and double-layer trigger of hardened steel. The zinc plated and chromate finished latches accommodate maximum working loads up to 13000 N. The rotary latching mechanism permits a tolerance of ±8 mm. A two-position rotor provides security against accidental opening. The latch housing measures 77 x 35.7 x 17.8 mm and is available in three different actuation styles.

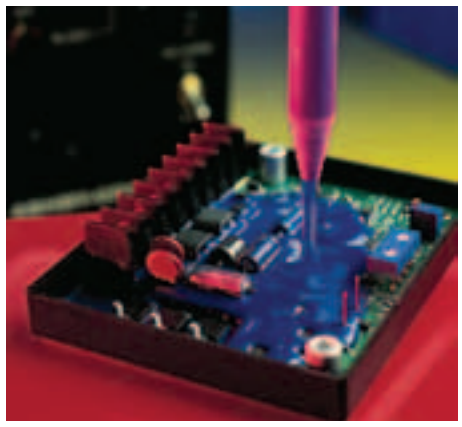
southco.com Info Card 310

Quick-locking assembly pin

The SLIC Pin from Pivot Point Inc. incorporates a wedge-shaped, spring-loaded plunger that functions as a self-contained cotter pin. When inserted, the angled face of the plunger causes it to retract. Once through the material being joined, the plunger automatically springs back up, locking the pin into place. It is designed to speed assembly times and is suitable for automated assembly, including in blind holes or tight spaces applications.

pivotpins.com Info Card 317

Potting compounds



Epoxies, Etc,... has added the 20-2300 series of flexible polyurethane potting compounds. Three different durometers are available ranging from Shore A 25 to 90. The soft polyurethanes do not impart any stress on electronic components during cure or when thermal cycled in assemblies. The series is suitable for continuous exposure in wet environments and does not absorb moisture.

epoxies.com Info Card 318

Double-coated polyester film

Adchem Corp. has introduced 2237M double-coated polyester film, used for bonding and laminating a wide variety of substrates, including plastics, metals, papers and nameplates. The adhesive's dimensional stability allows it to be used for stripping and die cutting. The film is comprised of a 1/2 mil polyester film coated on each side with 1.74 mils of a rubber-based, pressure-sensitive adhesive system. It is supplied on a 74# flat liner.

adchem.com Info Card 315

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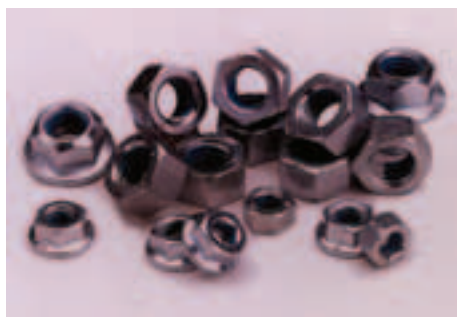
Info Card #58

Mounting assembly

A mounting assembly that consists of a hinged collar and an adjustable bracket, either of which can be the mounting base and have a device attached to the other side, has been introduced by Stafford Manufacturing Corp. The Two-Way Mounting Assembly comes in a variety of sizes in aluminum, steel, and stainless steel. The hinged collar has an I.D. from 1/2 to 4 in. that attaches to a 4 or 6 in. long mounting bracket using a cap screw.
staffordmfg.com Info Card 316

Patch resists vibration

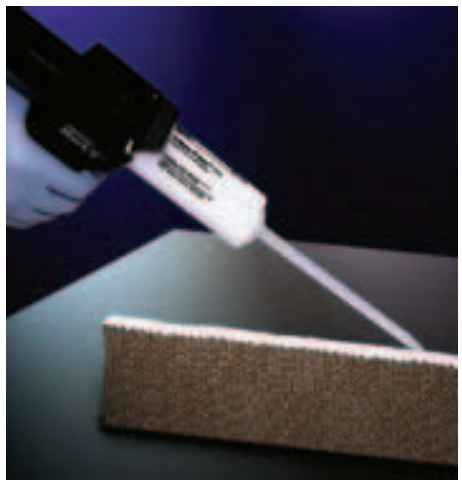


The patented Nylok Blue Torq-Patch process from Nylok Corp., a self-locking nylon patch, is permanently spray bonded onto the threads of most nut types. When mating threads are engaged, the element is compressed and a counterforce is created to establish a much stronger metal-to-metal contact, while allowing the locknuts to be adjusted or reused. The patch can be applied with coverage of 180° or 360° to any nut from as small as #10 (M5) and up. It works with different torque levels in temperatures from -56° to 121°C.
nylok.com Info Card 314

Flanged two-way clamps

J.W. Winco, Inc. has expanded its line of flanged two-way connector clamps. The bores of the flanged connector clamps are not machined and are designed for construction tubings GN 990 or DIN 2391, DIN 2395 and DIN 2462. They are made of aluminum with matte shot-blasted finish or black powder coat finish. The hexagon nuts are either zinc plated or in stainless steel to suit the screws. The clamps are available with in a variety of metric bore combinations, both round and square.
jwwinco.com Info Card 312

Flame-retardant epoxy



The 10 Minute Epoxy FR (flame-retardant) from Devcon fills gaps and bonds metals, fabrics, glass, wood and concrete in all combinations, and its properties make it suitable for securing honeycombed floor and ceiling panels in commercial airplanes. Mixed as dispensed, the epoxy has a viscosity of 80,000 cps, a working time of 10 min, a fixture time of 20 min, and a functional cure time of 3 h at 72∞F. Bonds pass the U.S. federal 60 s vertical burn test and the solvent-free formulation has low VOC emissions.
devcon.com/90 Info Card 311

Wire hook conveyor fasteners

Lacer installation of wire hooks is said to be simplified with the Clipper Roller Lacer Gold Class system from Flexible Steel Lacing Company. The portable tool handles wide belts and can be driven by a cordless drill (18 V or higher) or operated manually with a handle or ratchet in emergency situations. The Clipper Roller Lacer Gold Class system is available in widths of 24, 36, 48 and 60 in., and the tool features a shelf that supports the belt and guides it into the hook points during installation.
flexco.com Info Card 319

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Info Card #59

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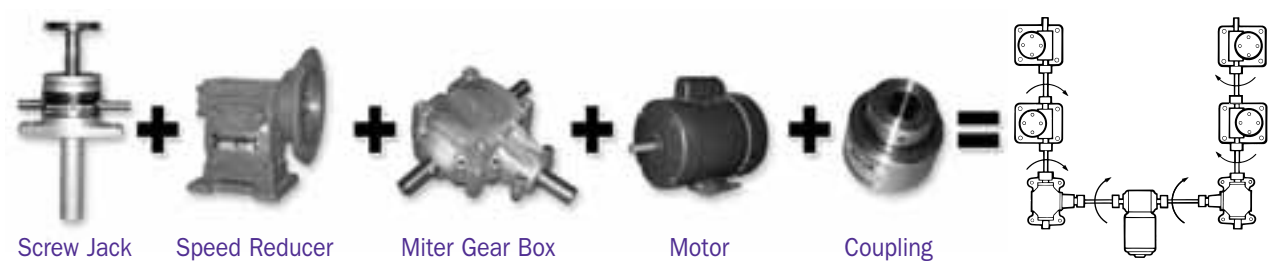

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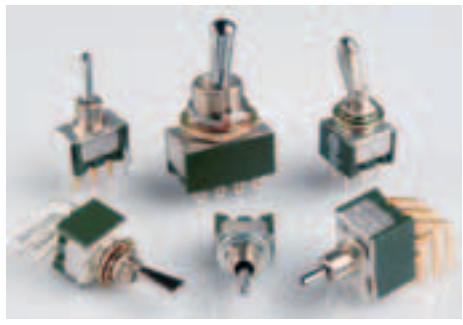
Info Card #63

Editor's Choice

Toggles offer combinations



NKK Switches has announced the M series of miniature toggle actuated switches comes in thousands of combinations. The series' bushing construction is said to prevent rotation or separation from the frame during installation. Anti-rotation design is standard on all non-cylindrical levers. The construction includes an interlocked actuator block to prevent switch failure due to biased lever movement. Insulating barriers increase the isolation of circuits in multi-pole devices and provide added protection to contact points.

nkkswitches.com Info Card 387

LED light strips

LEDtronics has announced TBL3xx Series Sealed Tube LED Light Strips in a clear lens. Units are suitable for illumination on applications such as RVs, buses, trains, task lighting, under cabinets, concealed lighting, edge lighting, cubicles, marine recreation applications and retail store displays. The construction consists of a UV-resistant polycarbonate housing over the LED tube. Tubes come in a variety 6, 12, 24 and 48 in. lengths to fit in many different locations, tight enclosures and spaces.

ledtronics.com Info Card 388

Turbocharged engines

Perkins Engines has introduced 400 series range of engines. The 404D-22TA is a 2.2 litre, 4-cylinder, turbocharged unit with air charge cooling -produces 49.2 kW at 2800 rpm from a package size of 0.25m^3, an 8% uprate compared to the 404D-22T model. The new unit provides 208 Nm of torque at 1800 rpm and meets the requirements of North American and European emissions legislation up to 2013. Compliance testing has shown 6000 h durability with oil and filter changes set at 500 h.

perkins.com Info Card 389

Handheld digital manometers

Designed for industrial or laboratory users needing an air pressure meter operable with one hand, Omega HHP-2000 series manometers are said to withstand continual heavy use in humid environments. The case has NEMA 4 rating and a LCD with backlight. Within the series four differential pressure models are available with ranges from 0 to 10 to 0 to 2815 in H_2O. Differential models can be used to measure gauge or vacuum by venting the low or the high port to atmosphere respectively. An absolute pressure model is also available with a range of 0 to 2815 in H_2O.

omega.ca Info Card 380

Monitor digital I/O interface

Molex Inc. has announced the development of the external DisplayPort Interconnect System. This system features a connector optimized for use in notebook and desktop PCs, and external cable assemblies for connection to LCD TVs and monitors. The connector conforms to the requirements outlined by the DisplayPort 1.0 Standard from the Video Electronics Standards Association (VESA). The connector system consists of 20-circuit, 0.50 mm pitch SMT, external receptacles designed with a polarized D-shape mating interface and metal shield for EMI/RFI protection.

molex.com Info Card 396

Express plastics color service

GE Plastics has announced its Custom Xpress color service, whereby customers can get the precise color of GE's Lexan or Cycoloy resin they require in six business days or less. The Web-based ordering system is said to give customers the flexibility to make changes up to 8 h prior to production. GE's digital global color database is also said to ensure consistency worldwide and from batch to batch.

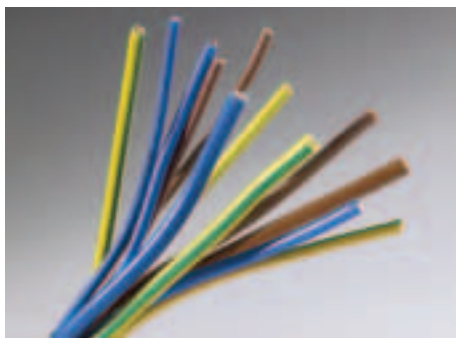
geplastics.com Info Card 392

Chair cylinder gas springs

Stabilus has introduced a pre-engineered line of STAB-O-MAT gas springs for variable and ergonomic seat height adjustment in office swivel chairs, task chairs, executive chairs and stools. Units absorb the weight on the seat and bending moments (caused by uneven weight distribution on the seat) and with the properly designed pressure cylinder, these tasks are performed by the internal gas spring. The gas springs are said to provide quick and easy assembly.

stabilus.com Info Card 395

Single wire HAR conductors



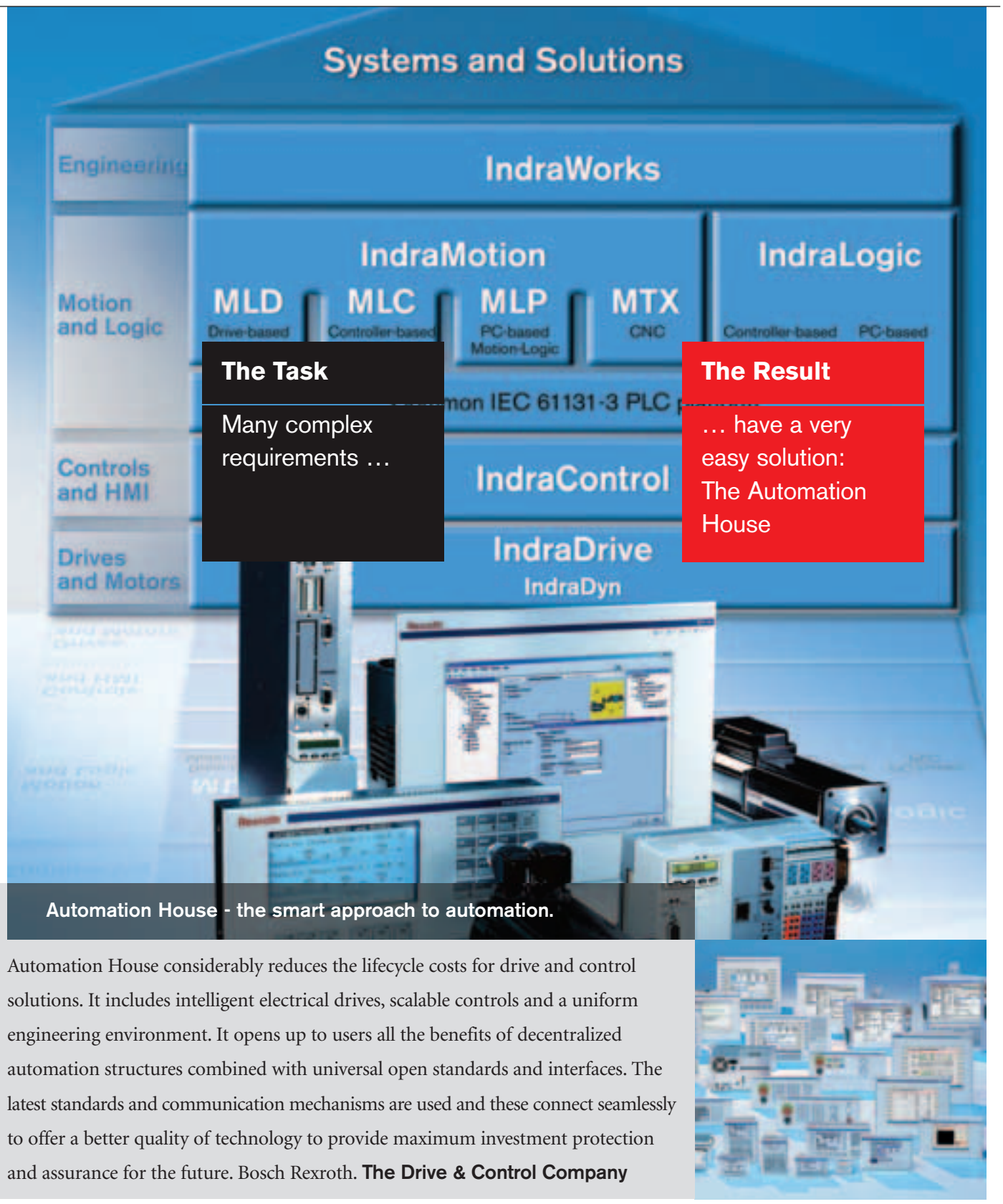
Interpower Corp. has introduced the Single Wire HAR Conductors to its product line. The conductors are intended for use in making electrical connections in equipment for European countries. The single conductor wires are available in brown, blue, yellow/green, black and red. They are available in sizes from a 0.75 to 16 mm^2 with ratings of 15 to 98 A at 250 Vac. The wires are RoHS compliant.

interpower.com Info Card 384

Nanoclay compounds

Specialty compounder RTP Company has announced advancements in its nanocomposite technology designed to meet the stringent barrier demands in fuel system applications. The nanoclay compounds can provide a monolayer solution for small engine and fuel tank manufacturers to meet the new fuel emission standards for recreational vehicles and lawn and garden equipment. Nanocomposite compounds contain organically-treated clay that separates into nanometer-sized platelets and disperses evenly throughout the resin.

rtpcompany.com Info Card 394



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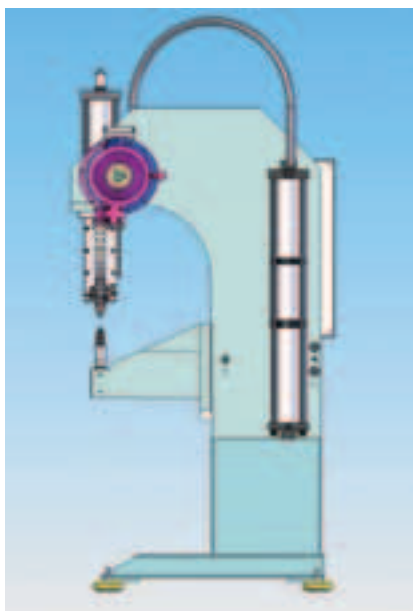
Info Card #66

Products: Editor's Choice

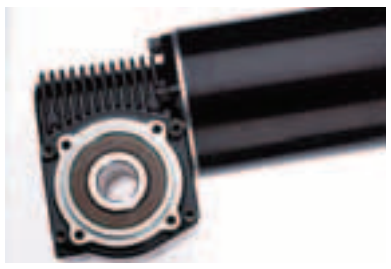
Automated impact riveter



Orbitform has announced the HP2000 hydra-pneumatic impact riveter. Available with up to a 24 in. throat, the riveter can autofeed and quickly set solid rivets up to 7/16 in. diameter. Other features include: 20 ton capacity; lubed for life ram assembly (less maintenance); single/multiple tooling available; ease of alignment (upper/lower tooling); and, the ability to set rivets at multiple finished heights. The unit can automatically compensate for minor material thickness or rivet length variances for consistent results.

orbitform.com Info Card 409

Low voltage gearmotors



Bison Gear and Engineering Corp. has introduced low voltage additions to the 750 series right angle gearmotor line. The additions consist of two input motor options rated at 1/8 hp, 12 Vdc and 1/8 hp, 24 Vdc. Gear ratios include 5, 10, 13, 20, 30, 45, and 60:1 and with a 3/4 in. diameter hollow shaft with face mount or a 5/8 in. diameter solid shaft insert with steel footplate.

bisongear.com Info Card 382

Anti-backlash nut

Haydon Switch & Instrument Inc. has developed a series of anti-backlash nuts. The series provides a patent pending method of preloading the threaded nut halves to provide a system that maximizes system stiffness while reducing drag torque. The nut design compensates for wear while eliminating lock-up issues common when traversing from worn areas to unworn areas of the screw. The nuts use a proprietary blend of self lubricating polyacetal in conjunction with precision rolled 303 stainless steel screw material.

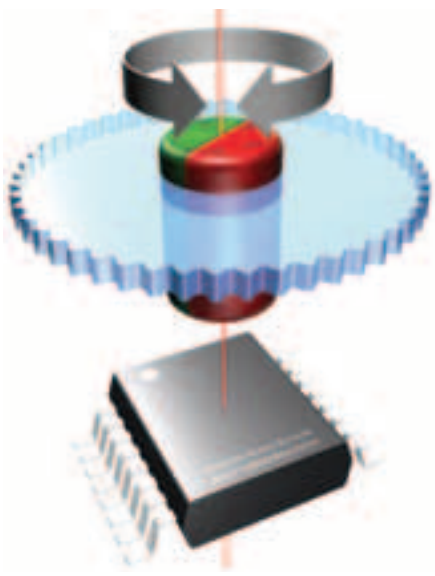
hsi-inc.com Info Card 399

PWM sensorless controller

Marktech Optoelectronics has introduced the Toshiba TB6575FNG PWM sensorless controller for 3- phase full wave brushless dc motors. Normally sensors (usually Hall-effect devices) are used to determine the rotor position in BLDC motors. The TB6575FNG provides sensorless commutation and PWM current control for 3-phase full-wave BLDC motors. Rotation speed is controlled through a variable PWM duty cycle controlled by an analog input voltage.

marktechopto.com Info Card 401

Rotary encoder software



austriamicrosystems has announced a free software development kit (SDK) for its magnetic rotary encoder IC line. The SDK is based on a Dynamic Link Library (DLL) that can be embedded in many software platforms, including Microsoft Visual Studio (C#, C/C++, Visual Basic), Borland C++ Builder or LabView. A number of application examples and help files included. The IC line includes the AS5035, an 8-bit resolution device with an Incremental output, 10-bit devices with digital and analog outputs (the AS5040 and AS5043 respectively), and the AS5045, a 12-bit device with an absolute digital output.

austriamicrosystems.com Info Card 402

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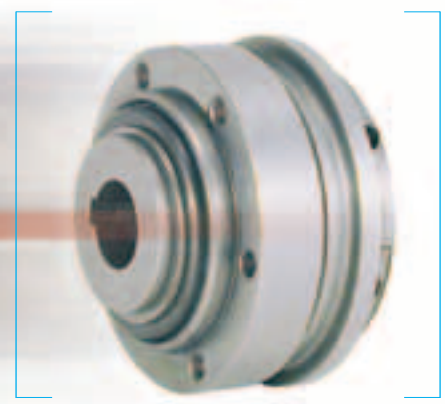

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Info Card #67

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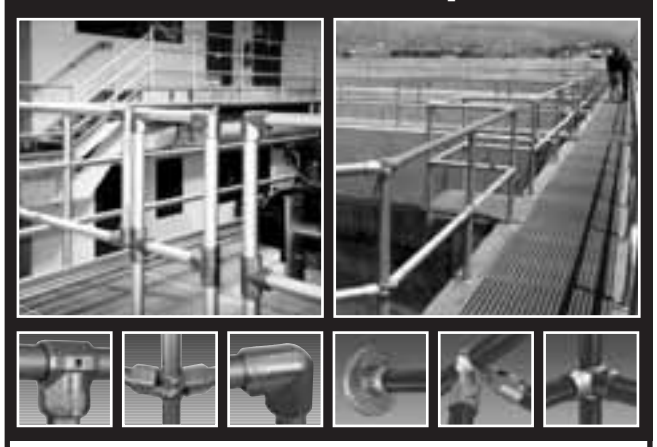

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Info Card #68

Switch for visually impaired

EAO Switch Corp. has introduced a black-and-white double On/Off switch to its RoHS compliant Series 44 industrial controls. The product features a large, illuminated central lens to indicate the status of equipment. It can be supplied with or without the engraved "I and O" symbols, and with either a matt grey or chromium-plated case. It is intended to comply with new regulations for visually-impaired users that govern the use of equipment by those who may find it difficult to distinguish between red and green On/Off positions.

eaoswitch.com **Info Card 391**

Analog converter/transmitter

Schneider Electric has announced Telemecanique Zelio Analog converters and transmitters convert signals emitted by sensors or electrical measurements into standard electrical signals that are compatible with automation systems. They also increase the connection distance between a sensor and the measurement acquisition device (e.g., between a thermocouple and a PLC). The converter/transmitter features pre-calibrated I/O ranges to facilitate installation. Switchable output signals – 0 to10 V, 0 to 20 mA and 4 to 20mA – are highly repeatable as a function of the input signal.

schneider-electric.ca **Info Card 405**

Safety interlock switch

Scientific Technologies, Inc. has introduced the MFS stand-alone safety interlock switch. The switch requires magnetic and ferroresonant signals to close the safety signals, making the switch highly resistant to tampering. Housed in a NEMA 4 enclosure, the unit provides up to 10 million actuations of operation. The switch is pre-wired and mounts on 1 in. square tubing. For lower risk applications it can be used as a stand-alone safety switch with direct switching of relays and contactors up to 2 A at 230 Vac.

sti.com **Info Card 407**

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Info Card #71

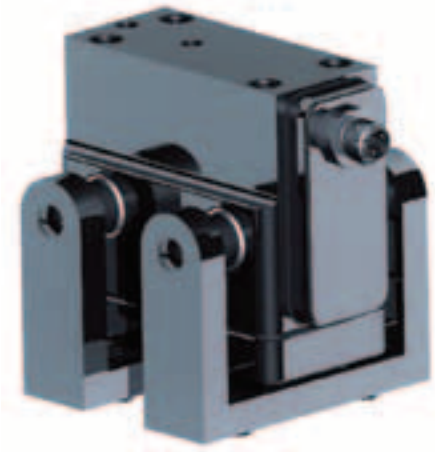
Products: Editor's Choice

SMT coin cell retainer

A top-loaded, low-profile coin cell retainer suited for high density PCB packaging has expanded Keystone Electronics Corp.'s selection of surface mount battery retainers for automated placement in SMT applications. Engineered with spring tension dynamics, the device assures low contact resistance, and is also available for through-hole use and features clearly marked polarity. The surface mount retainer accepts 11.6 mm coin cell lithium batteries.

keyelco.com Info Card 385

Food-handling gripper



Techno-Sommer Automatic has introduced the GGL3060 gripper, designed specifically for food-handling applications. The stainless steel gripper is sealed according to IP69K standards and features jaws that swing open 180°. Additionally, the angular design of the gripper provides up to 33 Nm of gripping torque and the unit includes sensors that sense jaw position.

techno-sommer.com Info Card 393

Ball bearing wheel caster

A low-profile caster introduced by The Revvo Caster Company, Inc., features a maintenance-free precision ball bearing wheel that provides low friction when moving equipment over level surfaces. The SL series caster has a 2 in. diameter polyurethane wheel and overall height of only 2-1/2 in. It has a load capacity of 350 lb, tread width of 1-1/16 in. and swivel radius of 2 in. The top plate has mounting holes to suit 1/4-in.

revvocaster.com Info Card 386

Standalone motion controller

TrustAutomation has introduced the dual-processor TA600 4-axis standalone motion controller for use with brushed, brushless and stepper motor drives. For application program execution, host communication and general I/O controls, a microcontroller is used. For the motion specific tasks, a DSP processor is used. C programmable, the default TA600 firmware uses a three letter command set, and user-programmable macros, Enable, Fault, Home and Limit levels. It also features an integrated Emergency Stop circuit for active or passive control of the complete system's safety features.

trustautomation.com Info Card 400

Microstepping drive/motor

Danaher Motion has introduced a stepper system consisting of a Pacific Scientific P7000 Series microstepping drive combined with a Pacific Scientific T, N or K series stepper motor. The combination is suitable for single or multi-axis applications requiring high-speed performance or low-speed smoothness. Currently available for ac operation, the system features a Motion Node option and an RS232 or RS485 multi-drop serial interface with an industry standard ModBus RTU protocol.

electromate.com Info Card 403

Shielded cordsets

Turck Inc. has announced the option to completely shield all molded M23 multifast cordsets by connecting a braided shield directly to the coupling nut. The method of shielding is said to provide a cost efficient and reliable home run connection with 100% cable and connector shielding providing protection against EM and RF interference. Turck currently offers 7-, 12- and 19-pin cordsets with PVC flexlife cable jackets.

chartwell.ca Info Card 383

Info Card #72

Variable speed ac drives

Schneider Electric Canada has introduced Simply Smart industrial ac drives for 3-phase asynchronous motors from 0.5 to 900 hp. The Altivar 71 model, dedicated to all industrial applications, is complemented by the Altivar 61, for pumps and fans. Altivar 71 can deliver up to 220% over-torque; 130% for Altivar 61. Both drives offer flux vector control (FVC) with or without sensor, online auto-tuning, speed or torque control, output frequency up to 1000 Hz and an energy saving function for pump and fan applications. One drive can independently control up to 3 motors, units withstand voltage drops of up to -50%, RF interference and operating temperatures up to 50ºC (without derating).

schneider-electric.ca Info Card 397

HMI on industrial PCs

Parker Automaton-CTC has released the latest addition to its EPX line of industrially hardened HMI PowerStations. The EPX10S is equipped with a 10 in. TFT, SVGA display and analog resistive touchscreen. Included in each system is an industrial PC pre-installed and licensed with InteractX Windows HMI unlimited-tag runtime software. Units have over 60 communication drivers, 40 GB hard disk storage and run a Windows XP Pro OS. Each system includes USB ports, RS-232 and RS-232/422/485 ports, and a 100BaseT Ethernet port.

parkermotion.com Info Card 406

USB connectors

Samtec has announced the addition of a high retention Type B USB interface (USBR Series) that complies with the Class 1, Div II minimum withdrawal requirement of 15 N. The connector has an orange color-coded insulator to differentiate it from standard withdrawal force connectors (USB series) that are available with white or black plastic. The USB connectors are available in surface mount and through-hole designs with a choice of standard right-angle or vertical top-entry orientation.

samtec.com Info Card 408

Info Card #73

Info Card #74

Info Card #75

Technical Literature

Control and measurement. *Condensed Handbook of Measurement and Control, 2nd Edition* by N.E. Battikha provides access to ISA symbology, instrument and control valve selection criteria, and conversion guidelines, with new sections on analyzers, programmable electronic systems, alarm and trip systems, control centers, enclosures, and engineering documentation.
isa.org Info Card 450

Fasteners. Catalog of nylon fasteners from **Micro Plastics** contains over pages of standard and metric machine screws, cap screws, nuts, washers, spacers, insulators, grommets, bushings, rivets, hole plugs, clamps, printed circuit board accessories, suspended ceiling hooks with accessories, wire routing kits and other hardware items.
microplastics.com Info Card 448

Adhesives. 60-page **ITW Devcon** catalog includes Devcon and Permatex brands, including Devcon epoxy and urethane compounds and Permatex lubricants, cleaners, and hand cleaners.
devcon.com/88 Info Card 452

Safety enclosures. Adalet has announced a 90-page catalog detailing over 500 increased safety terminal enclosures and systems.
adalet.com Info Card 453

Air driven liquid pumps. Maxpro Technologies has introduced a 24-page catalog detailing its line of Maximator high efficiency liquid pumps, said to be an economical source for hydraulic power and suitable for a broad range of oil, water and chemical applications.
maxprotech.com Info Card 454

Cylindrical connectors. Amphenol Industrial Operations catalog details its Amphe-Lite series of subminiature cylindrical connectors designed for signal, power, RF or fibre optic interconnect applications.
amphenol-industrial.com Info Card 455

Enclosures. Bud Industries, Inc. has announced its *Standard Products Catalog*. The 68-page enclosure catalog includes over 2500 products such as accessories, brackets, cabinets, card racks, chassis, communication products, die-cast aluminum boxes, large cabinet racks, open racks, plastic boxes and small metal enclosures.
budind.com Info Card 456

Aluminum extrusions. The **Aluminum Extruders Council** (AEC) has released the *Shapemakers Buyers' Guide* for 2006. It offers a directory of AEC aluminum extruder members and includes such information as company headquarters, plant locations, contact names, press sizes, maximum circle size, forms produced, and types of services offered.
aec.org Info Card 457

Conveyors. The **Dorner Mfg. Corp.** *"Why Dorner"* 10-min interactive video on CD-ROM shows how the company designs conveyors on a built-to-order basis and engineers new platforms said to represent the latest in conveyor technology.
dorner.com Info Card 458

Wastewater pumps. HELPS software on CD from **KSB Pumps Inc.** is said to make it easy for engineers and plant operators to select the right pump set for wastewater treatment applications.
ksb.ca Info Card 459

CAD Industry Watch

SolidWorks operates 'SWIFTly'

By Bill Fane

Parametric solid modeling has revolutionized how designers work. It is now possible to revert to the good old days, when we started with NAD (Napkin-Aided Design). It has been my observation over the years that the vast majority of engineering designs start life as a sketch on a coffee-shop napkin. They would then progress through several levels of more advanced sketch until we ended up with working drawings.
The introduction of CAD software helped in many ways, but hindered in others. Yes, we can now draw more accurately, but that can also be a problem in that it tends to force us to become too precise too soon in the design process.

Parametrics meets 'Napkin-Aided Design'

Parametric solid modeling overcomes that. No matter what the development level of a design, we can always get back to the NAD sketch to make changes, which reflect upward through the complete part and assembly modeling and drawing process.

The bad news is that parametric modeling can introduce its own set of constraints. In particular, the order in which features are added or subtracted to build up a part can be very significant.

SolidWorks 2007 (solidworks.com) has introduced SWIFT (SolidWorks Intelligent Feature Technology) to overcome this problem. If the designer tries to add a feature that is "impossible" because of the sequence in which things were created, then the FeatureXpert functionality examines the problem and determines the user's intent. For example, consider the relatively innocuous-looking part in figure 1. It consists simply of two extruded blocks, a couple of fillets, and it has been shelled out. So far so good.

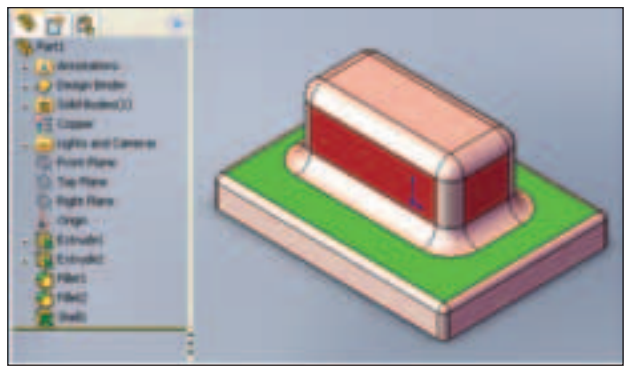
Next we want to apply a draft angle between the red faces and the green one. Previously this would generate an error, because the fillet has eliminated the junction line between the faces.

With SolidWorks 2007, however, this condition launches the FeatureXpert dialog box instead. If you allow the FeatureXpert to continue, it will do its best to analyze your intent and to apply the correct draft as shown in figure 2.
In particular, take a close look at the browser tree. The new Draft2 feature has been inserted at the correct location, as though you had applied the draft before the fillets and the shell.

Admittedly, this could have been done in the past by moving the end-of-part indicator bar above Fillet1, applying the draft, and then moving the end-of-part indicator bar back. In the real world, however, this is not always easily done on a complex part with many features. It can be difficult to determine the "correct" location in the tree, plus this process takes extra time.

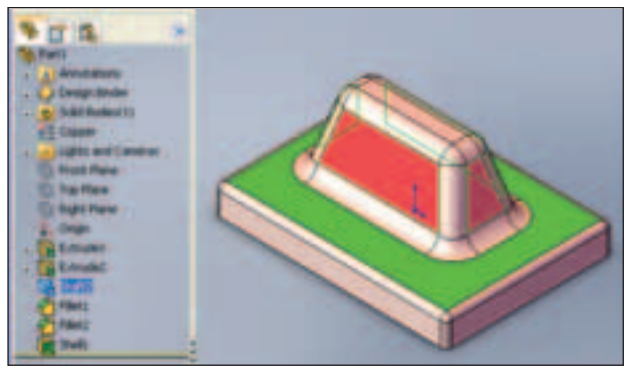
SWIFT is also available in the SketchXpert and MateXpert functionality to resolve problems with conflicting dimensions and constraints in sketches and assemblies, along with the new FeatureXpert, FilletXpert and DraftXpert functions.

These days, a great many machines are built on a relatively simple frame of standard structural shapes. SolidWorks 2007 has greatly improved the design and analysis of these frames. All you need to do is to place the individual beam shapes in the correct locations. The software will then apply appropriate welds to join everything together.



We want to apply draft angles between the red faces and the green ones.

Now comes the cunning part. When you apply your loads and perform the stress analysis, the software does not mesh the frame into the usual large number of simple elements and analyze them. Instead, it treats the frame for what it really is, being a relatively simple structure containing a few simple elements. The end result is that the analysis is performed considerably faster than if it had used "traditional" finite-element methods.



The FeatureXpert correctly resolves the draft problem.

I once saw a poster that said "I finally got it all together, but I forget where I put it." So, SolidWorks 2007 includes an interesting search engine to help you find your files. You can search by all or part of the file name, by text notes within the file, and by metadata such as the designer's name, the creation or modification date, the project name, and so on. Wild card characters work.

You can search your local drive, network drives, PDMWorks workgroups (see sidebar), the Design Library, and so on. Having found the desired file it can then be opened directly from within SolidWorks Search.

Bill Fane (bill_fane@bcit.ca) is a software reviewer and mechanical engineering instructor at BCIT in Burnaby, BC.

If you found **CAD Industry Watch** interesting, fill in **345** on the Info Card.

PDMWorks 2007 eases the chore of document management

PDMWorks is a document management system aimed specifically at the SolidWorks files within engineering workgroups. This can be a very big issue, even in a small office. Something as seemingly simple as a doorknob can end up involving 100 drawings. Revision control, history archiving, and modify rights can get very involved very quickly.

The document management system helps control this situation. Files are stored in a central vault, usually on a file server if two or more people are involved. They can be subdivided by project or workgroup, so that only those people who have been authorized for a specific project or group of files can access or modify them. Files must be signed out for editing, and when they are signed back in PDMWorks automatically creates an archived history of the previous version.

The system adds a number of interesting capabilities, including a new and easier-to-use interface. This includes the ability to sign out a file directly from within the SolidWorks file open dialog box. It is also tightly integrated with the new search engine capabilities, so a user can search the vault for a file and then sign it out, all from within SolidWorks itself.

James Achard, lead engineer for operations at SolidWorks user Skip Barber Racing Schools, and SolidWorks executives Jon Hirschtick, founder, Jeff Ray, COO and John McEleney, CEO, at the launch of SolidWorks 2007 in Concord, MA.

PDMWorks 2007 also supports integrated revision tables. This means that if a drawing contains a revision block, then it automatically updates to match the revision level and notes that are applied when the file is checked back in to the vault.

Even a one-person office can benefit from this sort of automatic document control.

Feature: CAD

PTC/user conference offers ideas for streamlining total product development

By Mike Edwards

DALLAS – The PTCuser World Event 2006 international conference formally welcomed two new software platforms into the Pro/Engineer line of related products.

Of particular interest to Pro/E Wildfire mechanical CAD and Windchill PLM users is the integration of Arbortext document management software into PTC offerings (ptc.com). Arbortext was acquired by Needham, MA-based PTC in the summer of 2005.

99-cent iTunes have more security than CAD files

The reason for the Arbortext acquisition was simple, according to Dick Harrison, president and CEO of PTC. The company wants to "acquire new technologies, not consolidate old, tired ones," Harrison told the conference.

P.G. Bartlett: Arbortext integration by year's end.

The market opportunity is compelling to Harrison: "We believe that companies spend 1% to 2% of their revenues on technical publications."

James Heppelmann, executive VP and chief product officer at PTC, told the PTCuser conference "Arbortext is Pro/Engineer for documents.

"Its hierarchical structure is analogous to the way Pro/E creates models." Heppelmann noted in his presentation that with Arbortext: users author documents as they would components and assemblies; components are stored in native XML format to maximize reuse; components are configured into document assemblies; documents can be published in multiple formats; and, documents and publications update associatively when components or configurations change.

Dick Harrison: technical publications an opportunity.

Dynamic publishing increases PLM (product lifecycle management) value, according to P.G. Bartlett, vice president, Arbortext product management at PTC. The current PTC environment for PLM and dynamic publishing allows for Pro/E 3D models to be ported into the Arbortext editor to create technical documents and to be housed in an Arbortext publishing engine-accessible content management system.

Brian Shepherd: more ECAD/MCAD associativity coming.

"The Arbortext-Windchill integration should be in place by the end of 2006," said Bartlett. At that time fully associative 2D and 3D graphics will be accessible by both the Arbortext editor and publishing engine, he added.

At the conference PTC also promoted its PLM On Demand business unit, created to meet the financial and functional PLM requirements of small- and medium-sized enterprises (SMEs). Jay Muelhofer, the unit's general manager, said it was "formed out of customer needs."

The on-demand service provides scalable access to Windchill, PTC's full PLM offering. Muelhofer told *Design Product News* that PLM On Demand can "help make small manufacturers look like the Toyotas of the world, as well as the divisions of larger businesses."

The service is hosted in partnership with IBM, who provides networks services such as hardware, firewall protection, UPS backup, biometrics and fire suppression systems. "Security is our number one concern," said Muelhofer.

He added that the on demand service is especially attractive to firms with either no IT department or an IT department that is under-performing from an engineering department perspective.

When PTC acquired Mathcad earlier this year, it added the ability to perform standard and proprietary engineering calculations using familiar math notations, with a bi-directional link that drives Pro/E parameters and dimensions. "Mathcad is Excel for engineers," said Heppelmann.

The package also produces documentation of engineering calculations.

Sandy Joung, product marketing director for Mathcad, told *DPN* that "its ability to display natural math equations makes it easier to visualize over spreadsheets." She said that Mathcad ultimately provides provenance, or the ability to not only trace the user who created the original file, but the source materials cited and any reference notes.

"This will provide auditability and traceability of engineering calculations," said Brian Shepherd, senior VP product management, PTC Product Futures.

Shepherd echoed Muelhofer's commitment to file address security with continuing vigour. "It's ironic that a 99-cent iTune has more security encrypted for re-use than access rights to CAD files."

Info Card 329

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Info Card #76

Feature: CAD

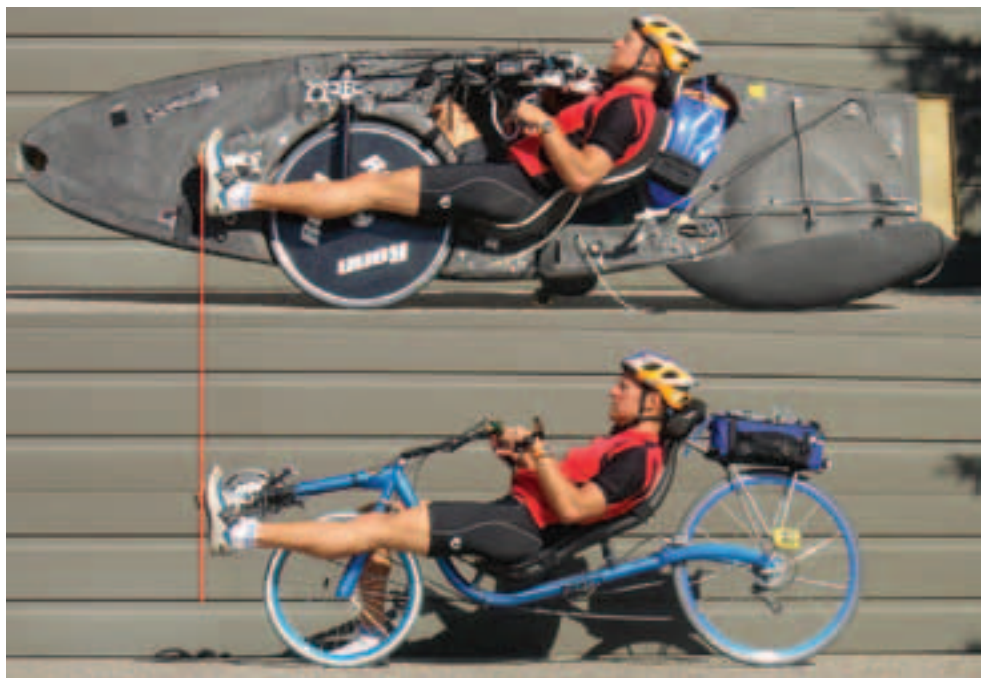
Human-powered vehicle claims 24-hour record

A Canadian designer has used SolidWorks and COSMOS software (solidworks.com) to develop and optimize a human-powered vehicle that claimed the 24-hour distance record in July. Capable of more than 60 mph, the machine is essentially a recumbent bicycle – one where the rider lies on his back – encapsulated in an aerodynamic carbon fiber fairing.

The "Critical Power" resembles an eight-foot long bullet and was the pilot's mobile home during the record attempt. Greg Kolodziejzyk, a top 10 age-group finisher in several Ironman triathlons, broke the 11-year-old record of 1,021.36 km in July, traveling 1046.94 km. The retired computer-imaging entrepreneur chose the Redwood Acres Motor Speedway in Eureka, CA, as his venue after evaluating 19 other tracks in North America for climate, surface and layout.

"SolidWorks and COSMOS software helped us develop what we are convinced is a superior design from aerodynamic, mechanical, and ergonomic standpoints," said designer Ben Eadie, owner of MountainWave Design Services in Calgary (mountainwave.com), before the attempt. "But the proof will be laid down on the track."

Eadie optimized the vehicle's aerodynamics by creating a "virtual wind tunnel" with COSMOSFloWorks computational fluid dynamics analysis software. He accomplished this by calibrating COSMOSFloWorks settings for turbulence, relative density, percentage error, and interactive elements with the solid body. After testing a series of established human-powered vehicle designs, he settled on an entirely new design that tapers to a thin vertical wedge in the stern. This shape serves to part the air and gently reassemble it with minimal turbulence.



The rider lies on his back encapsulated in an aerodynamic carbon fibre fairing (cutaway on top). The designer superimposed the photo onto a SolidWorks drawing to leverage the powerful pedal stroke (red line) of the triathlete.

The vehicle's shape resembles that of a fish. "We didn't start out thinking 'fish,' but when my designs follow nature, I always feel like I'm headed in the right direction," said Eadie. "Natural selection is probably the best design optimization process you can hope for." The virtual wind tunnel's findings correlated by more than 98% with calculations experienced on the track.

COSMOSWorks analysis software helped Eadie determine the amount of carbon fibre required for the shell design. It graphically highlighted hot spots that needed reinforcement and cold spots where a layer or two of fiber could safely be removed.

Eadie started the design process two and a half years ago with a photograph of Kolodziejzyk in a position that leveraged the powerful pedal stroke the triathlete had refined over thousands of miles of training. Eadie superimposed the photo onto a SolidWorks drawing, resulting in an ultra-efficient design allowing only single millimeters of clearance in all directions. The bike literally fits like a glove.

Eadie has used SolidWorks software since 1999 to develop the Critical Power as well as more traditional recumbent bicycles and special projects ranging from hydrogen fuel cells to diaper-changing tables. "With every release SolidWorks continues to prove why it is the most robust 3D CAD tool for designing better products, whether in carbon fibre, structural steel, plastics, or sheet metal," Eadie said.

Added Kolodziejzyk, "I don't know where SolidWorks and COSMOS leave off and where Ben's expertise begins, but the machine is fast."

For more information on the record attempt, visit Kolodziejzyk's Web site at http://www.adventuresofgreg.com/HPVMain.html.

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Info Card #77

Feature: CAD

Producing big cost savings for the automotive industry

Design of highly optimized racking systems

Maybe you've heard the infamous story of how one airline reduced operating costs by tens of thousands of dollars by eliminating a single olive in salads served in first class. While not every business can quickly make one seemingly insignificant change with exponential benefits, there are similarly "insignificant" ways for businesses to produce big cost savings.

Take the major automotive makers. There are many areas of the business – such as product development – that simply cannot be trimmed wholesale. However, there are still "olives" to be found.

R&W Metal Fabricating and Design Inc. (rwmetal.com), located in Brantford, ON, provides custom packaging solutions for automotive, commercial and industrial suppliers. Large U.S. and international automakers depend on the company to design and develop cost effective component racks. These racking solutions store parts during the transportation and assembly process.

According to industry estimates, an automaker can spend up to $50 million dollars on its component racking alone. Due to the volume of racks required, the number of units (parts) each rack can accommodate has a significant "trickle down" effect across the supply chain. By increasing the number of parts stored on each one, costs can be reduced exponentially. R&W Metal has developed a distinct competitive edge in the design of highly optimized racking solutions for manufacturing.

In most cases, R&W Metal starts with a model of the part to be racked. The models are typically provided by the automaker in a CATIA or UGS format. "Models are created using parametric tools," said engineering manager Jim Fleming, "which suits the automakers' needs but is not effective for R&W Metal Fabricating. In order for us to achieve maximum productivity, we use geometry-based tools to quickly make changes that can dramatically impact an automaker's bottom line."

The process usually goes like this: an automotive supplier sends R&W Metal Fabricating a CAD file from its primary CAD system. Fleming and his team use KeyCreator CAD software from Kubotek USA (kubotekusa.com), to read and understand any popular CAD file format. Once the file is available in KeyCreator, the team can often turn around initial concepts within one hour. Not only does this impress existing customers, but it also enables R&W to move very quickly on new business proposals.

Fleming and his team strive for maximum space optimization on their racks. Customers have come to expect the company's packaging experts to offer additional value in the rack design. There are times when Fleming and his team shortcut the development process by taking their concepts right to the customer's doorstep. Rather than sending files back and forth between multiple groups involved in decision-making, Fleming conducts live simulations of the racking options.

These "roundtable" meetings often involve any number of stakeholders managing the development process, e.g. designers, project managers, manufacturing engineers, union representatives and robotics managers. Fleming uses KeyCreator software to conduct a highly visual collaboration where decision makers are able to see the part and, in real time, understand the implications of recommended changes.

Fleming understands that key factors involved in the rack design will impact ergonomics, ease of extracting parts, robotic loading and plant floor concerns. Combining Fleming's expertise with KeyCreator tools, a process that could cause 10 or more revisions quickly becomes an "olive."

Here's where the automaker ultimately finds the savings. When an R&W customer is able to maximize the number of parts on a rack, the cost savings can be quickly quantified. Additional parts on a rack means less racks must be transported. More parts and fewer trucks create dramatic savings on items such fuel, fleet maintenance costs and labor.

This article was supplied by Kubotek USA. KeyCreator software is sold and supported in Canada by Kubotek directly, and by Canadian resellers Cadwire (cadwire.com) and Cornerstone Technologies (cornerstonemold.com).

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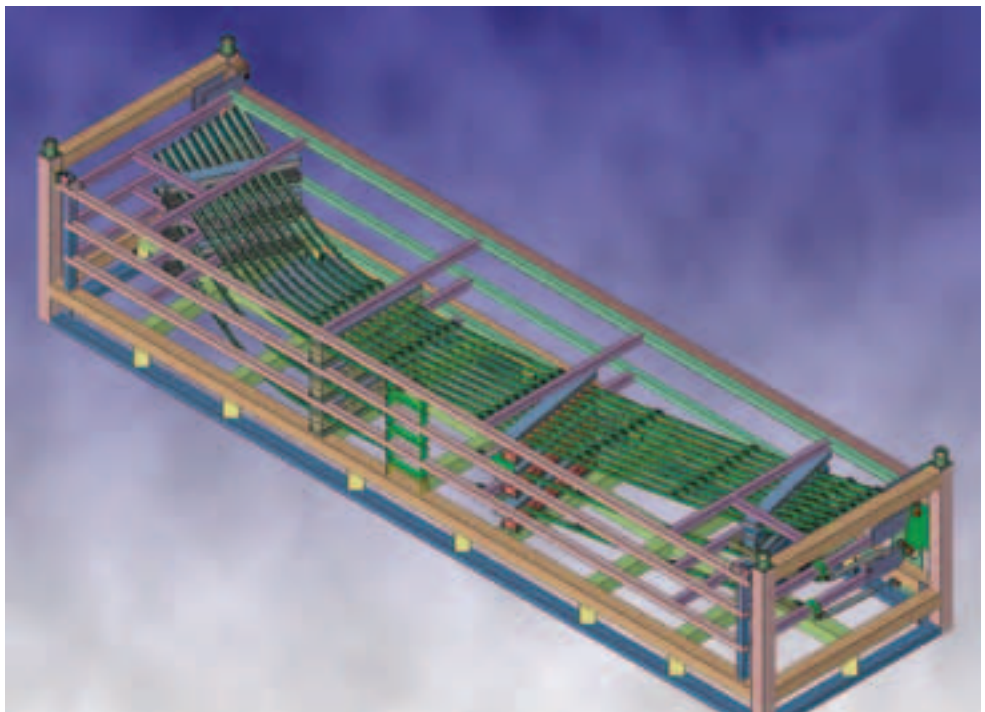

The R&W design team has tapped KeyCreator to satisfy automotive supplier racking requirements. One automaker ended up saving more than $1 million by implementing a simple design modification generated by the software.

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Advisory Board Directions

Trickle down effects of the energy sector boom has eastern companies looking west

By Rob Lemmen

This economy has been a funny one lately. Most of the economic indicators are sky high, but quite a few individual industries are still quite soft. Regionally, areas are behaving quite differently. In our own business of machine tool consumables and mechanical component design, we have seen quite a few local Ontario (Stoney Creek, Hamilton and St. Catharines) companies experiencing their own boom.

The fallout from a $70+ per-barrel of crude oil

The common factor in quite a few of these success stories is the energy sector: in other words, the fallout from a $70-plus-per-barrel of crude oil on world markets.

Whether it is power generation or natural resources, the energy sector is definitely climbing. This is having a trickle-down effect for a lot of metalwork and automation related companies.

The following companies illustrate this trend perfectly.

There is All Tool Automation Inc. with 30 employees in a 16,000 ft² facility in Hamilton, ON, operated by father and son, Gordon and David Viles (director of automation projects and general manager, respectively). All Tool Automation (alltoolgroup.com) started operations in 1986 as an automated systems manufacturer that also did tool and die work.

Today it still does a lot of fixtures for the automotive industry that they say remains quite buoyant due to overseas manufacturers who have set up operations in North America.

Their largest accounts now, however, are in services, machined components and systems for power generation.

Then there is Kerber Applied Research Inc. with 6 full time and several part time employees in a 1500 ft² facility in Stoney Creek, ON, operated by Tom Kerber. Kerber Applied Research (karcomm.net) started operations in 1991 specializing in RF communications with some mechanical expertise in casings and mechanical controls.

While the majority of their work is still in general electronics and programming, approximately 1/3 of Kerber's workload now is in service to the Canadian oil industry.

Kerber's break into the oil industry was in developing a device for wireless communication with drill head tooling. Developing electronic communications packages that fit in a 1.3 in. diameter casing, at 4 km deep, 5000 psi and 200ºC seemed like an insurmountable challenge. It has turned into a profitable niche. Many more opportunities are arising in sensing, control and communications in deep well applications.

The Windsor-Essex County Development Commission reports that Romeo Machine and Manufacturing Inc. has partnered with an oil sands operator in the Fort McMurray, AB, area. With this business deal, both companies are adding to their order books and are co-operatively quoting on new assignments.

Romeo President Vincent Del Duca admits to being somewhat surprised that companies that far away are eager to send assignments "all the way to Windsor" for work that he says "we can do in our sleep."

According to Roman Dzus, acting executive director of the Commission (choosewindsor.com), "Alberta simply does not have the infrastructure locally to deal with such a concentrated demand for services, including those that are available here among our large concentration of mold, tool, die and machinery expertise."

According to information gathered by Canadian Manufacturers and Exporters, (cme-mec.ca) Alberta's oil sands projects will create a number of opportunities requiring structural steel, metal fabricating, machining, maintenance supplies, boilers, pressure vessels and tanks, automation systems, turbines, pumps and environmental technologies, and more.

Where does the energy boom leave your business? Businesses in Alberta, such as drilling rig analyst Toppings Engineering featured in the June/July issue of DPN, are naturally experiencing the phenomenon first hand.

Perhaps, if you don't have a presence in Alberta already, the time may have come for your business to turn its eye west (or east, if you are in British Columbia).

Rob Lemmen, is senior designer and project consultant with the Korver Engineering Ltd. division of E.M. Precise Tool Ltd. (korver.ca). Info Card 341

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Pickering fab shop
turns to online service to find new customers and grow its business

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PICKERING, ONTARIO — Andy Pavletich, founder and owner, A.P.S. Metal Industries Inc, says his company specializes in stainless steel fabricating and forming of a variety of products (food processing equipment, hoppers, chutes, mixers, conveyor system parts, environmental products, packaging machinery parts, electronic enclosures and cabinets, display units, lighting fixtures, product holding fixtures, medical equipment, furniture and appliances and so on). The company employs 60-70 people and operates out of a 30,000 sq. ft. facility.

"We opened in 1986," Pavletich says, "and we've built our business on a reputation for quality, quick turnaround on delivery —sometimes in a matter of a few days to a few hours — and a fair and competitive price. But we knew we had to tap new customers and markets if we were to grow."

The company's Purchasing and Materials Manager, Rob Zakojc says he'd used the Internet to try to find new customers, and came across MFG.com, an online production-level solution for OEMs and suppliers of engineered-to-order components, which instantly and intelligently matches buyer requirements with potential suppliers possessing the right expertise, credentials, and capacity for the job being sourced.

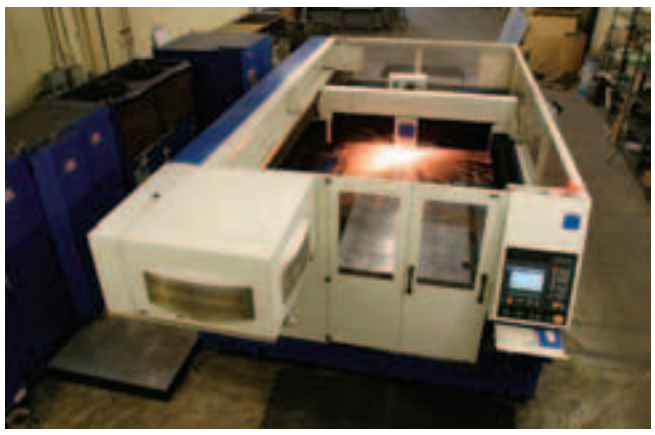
"When I came across the site," Zakojc says, "and took it for a test drive, I thought this might be the tool I've been looking for."

Zakojc says that for his purposes the site is a helpful new tool. "I'm able to check at any time of the day what RFQs are out there," he says. "And the real plus is that when I see an RFQ for fabrication or forming, I know that company has the work, wants it done, and wants it done now. If they match our capabilities and capacity, I'll bid. And it's so easy. I can't even begin to tell you how much time I've saved over traditional means of finding prospects and new customers. I can easily pull down and process 50 RFQs a day. When I get here in the morning, I turn my machine on and the site comes up. It stays on until I turn my machine off at night."

Suppliers can sign up for a FREE TEST DRIVE at http://dpn.mfg.com

Using the site

Zakojc says that using MFG.com is in at least one way like using any other new tool: The more you use it, the easier it is to use. "The first couple of times we used it," he says, "we really didn't understand where we were in the bidding hierarchy. It was like taking a risk, which is true of most things in business. But soon I became very familiar with the site."



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Extend your reach

Zakojc says that clearly one of the reasons A.P.S. Metal Industries joined MFG.com was to spread its reach and broaden its exposure to potential new customers. And apparently it's done just that. "The fact that we're Canadian," Zakojc says, "a lot of these customers would not have even thought to look here. At the same time, I wouldn't have thought to look at some of the smaller areas in the U.S. or even assume that I could work for these companies. But today freight is not really an issue whether your shipping from Toronto to Tennessee or Chicago, and NAFTA has opened the trade doors. What companies have to deal with now is really nothing more than some minor paper work issues."

Before joining, for example, Zakojc says he had a handful of U.S. customers. Today, he has 15 US companies and that number is growing. "What the site really does," he says, "is make everybody my neighbor, regardless where they are. Everybody is a company right down the street, and how great is that?"

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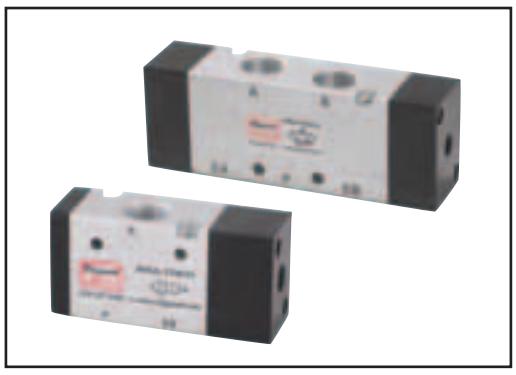

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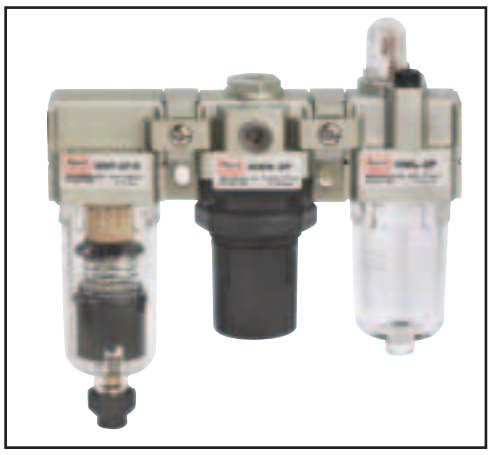

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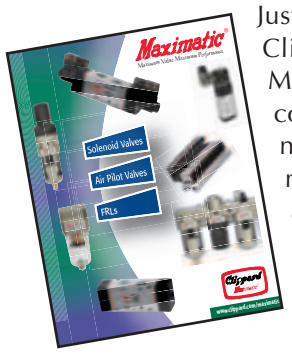

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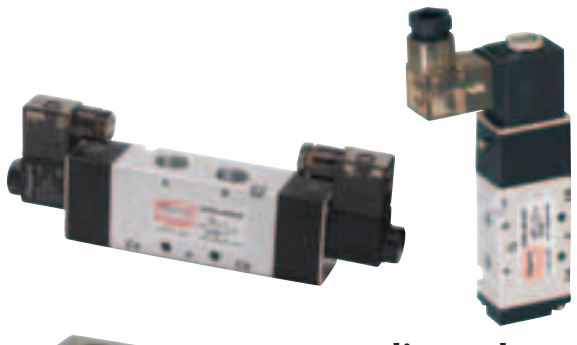

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Clippard all-new Solenoid valves are available in two-way, three-way and four-way configurations in port sizes from #10-32 to 1/2" NPT. Select either a direct-acting poppet or solenoid-controlled pilot operated balanced spool design. Spool valves are body ported but can be bolted to a parallel circuit manifold.

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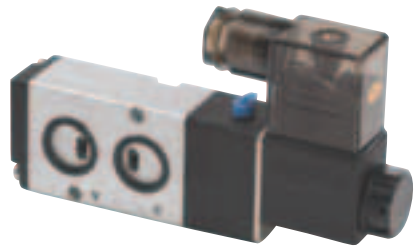

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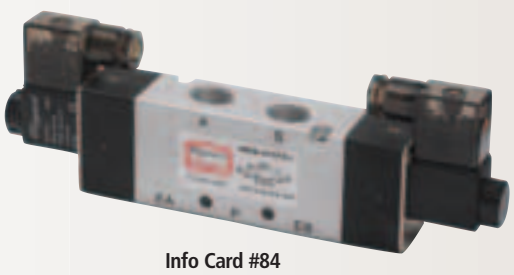

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Clippard's all-new line of Maximatic pneumatic Solenoid and Air Pilot Valves, and FRLs offer users quality products at extremely affordable prices.

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